"assigning" limitations are not described as methods of using the claimed decoding device. Accordingly, the *IXPL Holdings* and *In re Katz* cases cited by Microsoft do not apply. *See, e.g., In re Katz Interactive Call Processing Patent*, 639 F.3d 1303, 1318 (Fed. Cir. 2011) ("Like the language used in the claim at issue in IPXL ("wherein . . . the user uses"), the language used in Katz's claims ("wherein . . . callers digitally enter data" and "wherein . . . callers provide . . . data") is directed to user actions, not system capabilities.").

There is a difference between an improper mixed method-apparatus claim, and a wholly appropriate functional limitation. There is nothing inherently wrong with qualifying a structure in functional terms. Functional language does not in and of itself render a claim improper. *Linear Technology Corp.*, 379 F.3d at 1319-1321; *Yodlee, Inc. v. CashEdge, Inc.*, No. C05-01550 SI, 2006 WL 3456610 at *4 (N.D. Cal. 2006); *Eolas v. Adobe Sys.*, 2011 WL 3665342 (E.D. Tex. 2011). One having ordinary skill in the art would understand the scope of the claim and the circumstances under which the claims 7 and 8 are infringed. CX-719C (Drabik RWS) at 114.

D. Domestic Industry (Technical Prong)

Motorola's domestic industry products are Motorola VIP12XX series of set top boxes. The VIP12XX series of set-top boxes include the VIP1200, VIP1208, VIP1216, and VIP1225. CX-106C at MOTM_ITC 0020359; CX-706C (Drabik WS) at 258.

For the reasons set forth below, Motorola has satisfied the technical prong of the domestic industry requirement with respect to the '094 patent.

Claim 8

The preamble of independent apparatus claim 8 recites:

> **A device for decoding digital video content wherein the digital video content is represented in a one dimensional array of frequency coefficients, wherein the one dimensional array of frequency coefficients is represented by a variable p=0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15, the device comprising:**

Motorola has satisfied the preamble.

The claim term "one dimensional array" has been construed to mean "a set of items arranged in a single column or row." The claim term "one dimensional array of frequency coefficients" has been construed to mean "a set of frequency coefficients arranged in a single column or row."

The claim term "wherein the one dimensional array of frequency coefficients is represented by a variable p=0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15" has been construed to mean "the position of a frequency coefficient in the one dimensional array is represented by a variable p that can be 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15."

In compliance with the H.264 Standard, and consistent with the above claim constructions, the VIP12XX decodes digital video content in a manner that satisfies the preamble. CX-706C (Drabik WS) at 262-66, 299-302. The SMP8634 chip incorporated into the VIP12XX has an H.264 decoder that includes the inverse scan. CX-214C at SIGMA_0000542. In the SMP8634, the "one dimensional array" is a [ ] of a [ ] and a [ ] that [ ] as [ ]. CX-214C at SIGMA_0000578.

[

] CX-214C at SIGMA-0000578. [

] CX-706C (Drabik WS) at 302; Drabik Tr. 555.

Microsoft argues that the [ ] cannot be the "one dimensional array" because [ ] However, Dr. Drabik identified more than just the [ ] as the 1-D array; he identified the [ ] values. Dr. Mitzenmacher admitted that [ ] are the coefficients and, to send more than one coefficient, the VIP12XX would send multiple instances of [ ] Mitzenmacher Tr. 1709-10. Thus, [ ] comprise the claimed "one dimensional array." CX-706C (Drabik WS) at 265-66.

Microsoft also argues that this array does not have a length of 16 and is not "represented by a variable p=0, 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, or 15." However, Dr. Mitzenmacher admitted that the [ ] and further admitted that [ ]. Mitzenmacher Tr. 1710. [

]

Finally, Microsoft argues that the [ ] is not the claimed "one dimensional array." This is irrelevant. Dr. Drabik did not identify the [ ] as the claimed "one dimensional array" in his

testimony.[61]

The first element of claim 8 recites:

> **a generator that produces a representation of the digital video content in a two dimensional array of frequency coefficients, the two dimensional array of frequency coefficients is represented in columns and rows wherein the columns are represented by a variable n=0, 1, 2, or 3, and the rows are represented by a variable m=0, 1, 2, or 3, further comprising;**

Motorola has satisfied this claim element.

The claim term "generator that produces a representation of the digital video content in a two dimensional array of frequency coefficients" has been construed to mean "portion of the decoder that produces a representation of the digital video content in a two dimensional array of frequency coefficients."

The VIP12XX includes a generator, which is the portion of the H.264 video decoder [ ] that produces a representation of the digital video content in a 2-D array. In compliance with the H.264 Standard, the VIP12XX meets this limitation. CX-706C (Drabik WS) at 266-72, 299-302.[62]

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[61] Dr. Drabik identified the [ ] as a "one dimensional array" in claim charts attached to his expert reports. However, Dr. Drabik amended this identification in his Witness Statement submitted September 27, 2011, in direct response to a late supplemental report submitted by Microsoft's expert.

[62] Microsoft has objected to Q487 on page 271 of Dr. Drabik's Witness Statement (CX-706C), submitted September 27, 2011. By its objection to Q487, Microsoft seeks once again to reopen Order No. 32. Q487 was the subject of a Microsoft motion *in limine* that was denied by Order No. 32. *See* Motion Docket No. 752-18 at 4-5; Order No. 32 at 2. Dr. Drabik's testimony in Q487 relates to the late Sigma discovery that the Court granted Motorola leave to rely upon in Order No. 24. Following that order, Microsoft served a supplemental report that addressed the Sigma discovery. *See* Clements Decl., Exhibit A Supplemental Expert Report of Dr. Michael Mitzenmacher. Dr. Drabik's testimony in Q487 is directly responsive to ¶97 of Mitzenmacher's Supplemental Report. There is no

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The H.264 Standard specifies an inverse field scan for 4 4 transform coefficients wherein the output of the process is a two-dimensional array of 4 4 values. CX -29 at 179-80.

[

]

prejudice to Microsoft by the admission of Q487. Microsoft had three months to respond to Dr. Drabik's testimony in Q487, and responded to Q487. *See, e.g.*, Dr. Mitzenmacher's Rebuttal Statement, RRX-7C (Mitzenmacher RWS) at 254, 270-72. In connection with Order No. 24, Microsoft also had an opportunity to depose Dr. Drabik on his opinions expressed in Q487, but declined to do so. Microsoft's objection is moot in view of Order No. 32, there is no prejudice to Microsoft, and Microsoft's objection to Q487 is overruled.

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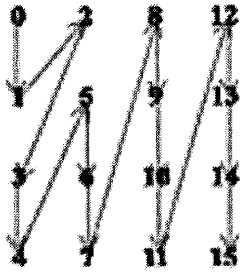
CX-344C at SIGMA_SRC_0000039-41 (emphases added). [

] CX-706C (Drabik WS) at 269. [

] Accordingly, the field scan pattern is as follows:



This is the scan pattern claimed in the '094 patent. *See also* CX-344C at SIGMA_SRC_0000033, SIGMA_SRC_0000040. [

] CX-706C (Drabik WS) at 270.

[

]

CX-214C at SIGMA_0000579 (emphases added); *see also* CX-706C at 271; RRX-7C at 263.

Microsoft argues that [ ] because it [ ] However, as Dr. Drabik explained, [ ] it output by [ ] CX-706C (Drabik WS) at 269. The next stage in the decoding pipeline of the SMP8634 understands [ ] otherwise, the inverse transform could not be performed properly.

Microsoft also argues that a [ ] is not the claimed "two dimensional array." This argument is irrelevant; Dr. Drabik did not identify the [ ] as the claimed "two dimensional array" in his testimony. CX-706C (Drabik WS) at 270-71.

Finally, Microsoft argues that there is no "generator" in the VIP12XX because the [ ] cited by Dr. Drabik is just a [ ] that does not, by itself, [ ]. However, Microsoft ignores Dr. Drabik's testimony that explains how [ ] CX-706C (Drabik WS) at 270-71.

The second through the seventeenth elements of claim 8 recite:

> **assigning the two dimensional frequency coefficient located at n=[ ] and m=[ ] a value of the one dimensional frequency coefficient located at p=[ ]**

Motorola has satisfied these claim elements.

The claim term "assigning the two dimensional frequency coefficient located at

n=[ ] and m=[ ] a value of the one dimensional frequency coefficient located at p=[ ]" has been construed to mean "setting the value of the two dimensional frequency coefficient located at n=[0-3] and m=[0-3] to the value of the frequency coefficient located at position p=[0-15]."

The claim term "a value of the one dimensional frequency coefficient located at p=[ ]" has been construed to mean "a value of the frequency coefficient located at a position p in the one dimensional array."

The VIP12XX meets these limitations. CX-706C (Drabik WS) at 272-302. The H.264 Standard describes the inverse scanning process for 4 4 coefficients. CX -29 at 179-80 (shown in Figure 8-8(b)). Sigma's HDL module [ ] confirms that this step is performed. CX-344C at SIGMA_SRC_0000039-41. The VIP12XX assigns each two dimensional frequency coefficient located at n=0...3 and m=0...3 a value of the 1-D frequency coefficient located at p=0...15. The VIP12XX always assigns a value from the 1-D array to each and every location of the 2-D array, regardless of the number of nonzero values. CX-706C (Drabik WS) at 270. Each position of the 1-D array between the positions identified by the [ ]. The zero values, like the nonzero values, are assigned to locations in the [ ]. If the 1-D array contains 16 non-zero values, the VIP12XX assigns all 16 of those values. CX-706C (Drabik WS) at 301-302.

Microsoft argues that the VIP12XX does not meet the "assigning" limitations because being capable of assigning sixteen frequency coefficients is not sufficient to show infringement. As discussed above with respect to infringement, Microsoft is

incorrect as a matter of law. The VIP12XX meets the "assigning" limitations because its hardware assigns 16 frequency coefficients when decoding digital video content, regardless of whether that video content contains a 1-D array with 16 nonzero values.

VII. U.S. Patent No. 6,980,596

U.S. Patent No. 6,980,596 ("the '596 patent") is titled, "Macroblock Level Adaptive Frame/Field Coding for Digital Video Content." JX-7 ('596 patent). The '596 patent issued on December 27, 2005, and the named inventors are Limin Wang, Rajeev Gandhi, Krit Panusopone, and Ajay Luthra. *Id.* The '896 patent relates to "encoding and decoding of digital video content," and more specifically, relates to "frame mode and field mode encoding of digital video content at a macroblock level as used in the MPEG-4 Part 10 AVC/H.264 standard video coding standard." *Id.* at col. 1, lns. 22-26 (Technical Field).

Motorola asserts independent method claim 1 and dependent claim 2. The asserted claims read as follows:

> **1**. A method of encoding or decoding digital video content, said digital video content comprising a stream of pictures which can each be intra, predicted, or bi-predicted pictures, each of said pictures comprising macroblocks, said method comprising the steps of:
>
> selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode;
>
> arranging said group of neighboring macroblocks for processing into frame macroblocks or field macroblocks according to the selected one of said frame mode or said field mode; and
>
> encoding or decoding said frame macroblocks or said field macroblocks, wherein, the step of arranging said group of neighboring macroblocks for processing into

frame macroblocks or field macroblocks includes the step of:

in frame mode, jointly processing two fields in said group of neighboring macroblocks, said group of neighboring macroblocks being divided into frame macroblocks, and each of said frame macroblocks including both top and bottom field pixels;

in said field mode, separately processing two fields of said group of neighboring macroblocks, said group of neighboring macroblocks being split into field macroblocks, and each of said field macroblocks including either top or bottom field pixels, and wherein said frame macroblocks and said field macroblocks are the same size.

2. The method of claim **1**, wherein said frame or field macroblocks can be divided into blocks, and each of said block comprises 16x16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels.

JX-7 at col. 18, lns. 6-38.

A. Claim Construction[63]

1. "macroblock" (claims 1, 2)

Claim Term	Motorola's Proposed Constructions	Microsoft's Proposed Constructions
"macroblock" (claims 1, 2)	a picture portion comprising a 16 16 pixel region of luma and corresponding chroma samples	a rectangular group of pixels

The claim term "macroblock" appears in the preamble and each of the three steps

[63] A person of ordinary skill in the art of the '596 patent in 2001 would have had at least a bachelor's degree in electrical or computer engineering or the equivalent, and at least three years of work experience in the field of video processing, or at least a master's degree in electrical or computer engineering or the equivalent, and at least one year of work experience in the field of video processing. CX-706C (Drabik WS) at 7.

of independent method claim 1, and in claim 2. JX-7 at col. 18, lns. 6-38.[64]

Motorola construes the term to mean "a picture portion comprising a 16 16 pixel region of luma and corresponding chroma samples." Compls. Br. at 118; RX-394 (Joint Identification of Claim Terms and Proposed Constructions) at 1. Microsoft construes the term to mean "a rectangular group of pixels." Resp. Br. at 189; RX-394 at 1.

As proposed by Microsoft, the claim term "macroblock" is construed to mean "a rectangular group of pixels."[65]

The '596 patent expressly defines the term "macroblock."

> FIG. 2 shows that each picture (200) is preferably divided into slices (202). A slice (202) comprises a group of macroblocks (201). A macroblock (201) is a rectangular group of pixels. As shown in FIG. 2, a preferable macroblock (201) size is 16 by 16 pixels.

JX-7 at col. 5, lns. 61-65 (emphasis added).

According to the '596 patent, "[a] macroblock (201) is a rectangular group of pixels." The above specification portion also explains that the 16x16 macroblock size is only an example. Additionally, the specification explains that the dimensions of a macroblock are variable. JX-7 at col. 7, lns. 14-17 ("In FIG. 5, the macroblock has M rows of pixels and N columns of pixels. A preferable value of N and M is 16, making the macroblock (500) a 16 by 16 pixel macroblock.") Figures 5 and 8 depict this variable representation – the macroblocks are shown as having dimensions M x N, not 16 x 16.

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[64] Although the term used in the claims is actually the plural form "macroblocks," the administrative law judge is construing the singular form "macroblock."

[65] It is noted that the United States District Court of Washington (Western District) construed the claim term "macroblock" to mean "a rectangular group of pixels." *Microsoft Corp. v. Motorola Mobility, Inc.*, No. C10-1823-JLR, Dkt. No. 258 at 17 (W.D. WA., Apr. 10, 2012).

The specific values M=16 and N=16 are only part of a preferred embodiment. Claims are not limited to the preferred embodiment.

Despite this express definition, Motorola proposes limiting "macroblock" to the size of the preferred embodiment: "16 x 16 pixel region of luma and corresponding chroma samples." Limiting a "macroblock" to a 16x16 pixel region is inconsistent with the specification.

Motorola argues that the H.264 draft standard that the patent incorporates provides an explicit definition of macroblock. Compls. Br. at 119. Motorola, however, ignores that the patent expressly states that it is not limited to any standard. JX-7 at col. 4, lines 54-57 ("Although this method of AFF encoding is compatible with and will be explained using the MPEG-4 Part 10 AVC/H.264 standard guidelines, it can be modified and used as best serves a particular standard or application."); *see also* Drabik Tr. 2417-18. Indeed, on cross examination at the hearing, Dr. Drabik admitted that each of the four different standards (CX-137, RX-303, RX-293, and RX-20) was consistent with Microsoft's proposed construction. Drabik Tr. 2343-50.

Motorola also uses a quotation from the '596 patent's provisional application as support for its proposed construction. Motorola claims that ¶ 32 of the provisional application, CX-171, states: "Each macroblock is 16x16 pixels." CX-706C (Drabik WS) at 366. In fact, earlier, that paragraph states: "The typical macroblock is 16x16 pixels." CX-171 at MOTM ITC 0016288, ¶ 32. The patent application also explains that the "illustrated embodiments are examples of the present invention and do not limit the scope of the invention." CX-171 at MOTM ITC 0016286, ¶ 15.

Moreover, the extrinsic evidence shows that "macroblock" does not always refer

to16x16 pixels. For example, two separate 1991 submissions to the Moving Pictures Experts Group defined a macroblock as a 16x8 pixel region. RRX-69.0003-4; RRX-70.0005. A contemporaneous patent application stated that "a typical size for a macroblock **510** is eight pixels by eight pixels." RRX-117 at ¶ 8; RRX-117 at Fig. 5. When Dr. Drabik was confronted with these documents, he admitted that they described 16 x 8 and 8 x 8 pixel regions as macroblocks. *See* Drabik Tr. 2351-55, 2358-60.

2. "selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode" (claim 1)

Claim Term	Motorola's Proposed Construction	Microsoft's Proposed Construction
"selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode" (claim 1)	choosing which mode, frame mode or field mode, to use in encoding or decoding a group of neighboring macroblocks	choosing to encode or decode a group of neighboring macroblocks in a frame mode or a field mode

The claim term "selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode" is the first step of independent method claim 1. JX-7 at col. 18, lns. 6-33. [66]

Motorola construes the term to mean "choosing which mode, frame mode or field mode, to use in encoding or decoding a group of neighboring macroblocks." Compls. Br. at 122. Microsoft construes the term to mean "choosing to encode or decode a group of neighboring macroblocks in a frame mode or a field mode." Resp. Br. at 183; RX-394 at 1.

[66] There is a typographical error in the claim term that is to be construed in the *parties' briefs and RX-394*. The claim term to be construed is "selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode," and not "selecting to encode or decode a group of neighboring macroblocks in frame mode or a field mode." *See* Compls. Br. at 122; Resp. Br. at 182, 183, 186; RX-394 at 1.

As proposed by Motorola, the claim term "selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode" is construed to mean "choosing which mode, frame mode or field mode, to use in encoding or decoding a group of neighboring macroblocks."

The claim language is slightly ambiguous in that the "selecting" step could mean choosing between encoding and decoding, or choosing between a frame mode and a field mode.

However, the specification is instructive in clarifying this ambiguity. The '596 patent discloses:

> The present invention provides a method of adaptive frame/field (AFF) coding of digital video content comprising a stream of pictures or slices of a picture at a macroblock level. The present invention extends the concept of picture level AFF to macroblocks. In AFF coding at a picture level, each picture in a stream of pictures that is to be encoded is encoded in either frame mode or in field mode, regardless of the frame or field coding mode of other pictures that are to be coded. If a picture is encoded in frame mode, the two fields that make up an interlaced frame are coded jointly. Conversely, if a picture is encoded in field mode, the two fields that make up an interlaced frame are coded separately. The encoder determines which type of coding, frame mode coding or field mode coding, is more advantageous for each picture and chooses that type of encoding for the picture. The exact method of choosing between frame mode and field mode is not critical to the present invention and will not be detailed herein.

JX-7 at col. 4, lns. 23-40 (emphases added).

In this description of an encoder, the specification of the '596 patent shows that the claim term "selecting" relates to the coding mode (*i.e.*, frame mode or field mode), and not to whether to encode or decode the claimed group of neighboring macroblocks.

Neither the claim nor the specification imposes any limitation on how a decoder chooses to decode a group of neighboring macroblocks.

Both parties agree that the word "selecting" means "choosing." Compls. Br. at 122; Resp. Br. at 183. Accordingly, consistent with the specification, the administrative law judge construes the term "selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode" to mean "choosing which mode, frame mode or field mode, to use in encoding or decoding a group of neighboring macroblocks."

3. "group of neighboring macroblocks" (claim 1)

Claim Term	Motorola's Proposed Construction	Microsoft's Proposed Construction
"group of neighboring macroblocks" (claim 1)	*No construction necessary.* *If construed:* a collection of neighboring macroblocks	three or more adjacent macroblocks

The claim term "group of neighboring macroblocks" appears in each of the three method steps of independent claim 1. JX-7 at col. 18, lns. 6-33.

Motorola argues that no construction is necessary, or in the alternative, Motorola proposes the term to mean "a collection of neighboring macroblocks." Compls. Br. at 122. Microsoft construes the term to mean "three or more adjacent macroblocks." Resp. Br. at 179-80; RX-394 at 1.

As proposed by Motorola, the claim term "group of neighboring macroblocks" need not be construed because the word "group" has a plain and ordinary meaning.

The parties dispute whether ***two*** neighboring macroblocks may be a "group." There is no dispute between the parties about the ordinary meaning of the term "group,"

and thus the claim term does not require a construction (*i.e.*, the term can be applied as is, based on its ordinary meaning).

"Group" is a word that has a common ordinary meaning to lay persons and persons of ordinary skill alike, *i.e.*, a collection of objects that can be treated as a unit or whole. *See, e.g.*, CX-177 at MOTM_ITC 0507070. The prepositional phrase "of neighboring macroblocks" serves its ordinary purpose of identifying what types of objects are in the group. None of the words of the term, alone or together, specifies the number of objects in the group, other than that there must be at least two, as implied by the use of the word "group" and the plural "macroblocks."

The '596 patent specification and the prosecution history supports this conclusion. Microsoft proposes the construction "three or more adjacent macroblocks" that would exclude the embodiment of the '596 patent that corresponds to the incorporated H.264 Standard, in which coding is performed on a pair (*i.e.*, a group of two) of macroblocks. It is improper to adopt a construction that would exclude the preferred embodiment. *See On-line Techs., Inc. v. Bodenseewerk Perkin-Elmer GmbH*, 386 F.3d 1133, 1138 (Fed. Cir. 2004). Doing so would be in direct contradiction to the teaching of the '596 patent:

> The present invention relates to encoding and decoding of digital video content. More specifically, the present invention relates to frame mode and field mode encoding of digital video content at a macroblock level as used in the MPEG-4 Part 10 AVC/H.264 standard video coding standard.

JX-7 at col. 1, lns. 22-26 (emphasis added).

> Although this method of AFF encoding is compatible with and will be explained using the MPEG-4 Part 10 AVC/H.264 standard guidelines, it can be modified and used as best serves a particular standard or application.

JX-7 at col. 4, lns. 54-57 (emphasis added).

Indeed, nothing in the '596 patent suggests an embodiment in which coding is performed on a group of three macroblocks. *See* Drabik Tr. 565; Mitzenmacher Tr. 1606-1608. The '596 patent teaches the H.264 Standard embodiment, operating on a group of two neighboring macroblocks (a "macroblock pair"), and an alternative embodiment, operating on a group of four or more macroblocks. JX-7 at col. 7, ln. 32-col. 8, ln. 51.

Moreover, teaching an embodiment in which a group has four or more macroblocks does not limit the '596 patent claims to that embodiment or otherwise exclude a macroblock pair from being the claimed group. *See, e.g.*, *Commonwealth Scientific*, 542 F.3d at1385 (describing interleaving of data in two-bit blocks does not mean that claims must be limited to interleave blocks consisting of at least two bits); *Epistar Corp. v. U.S. Int'l Trade Comm'n*, 566 F.3d 1321, 1337 (Fed. Cir. 2009) ("While the '718 patent describes a thicker layer as a 'substrate,' the Commission followed this court's precedent in declining to limit the construction of 'substrate' to that embodiment."). Claim 1 of the '596 patent does not quantify the term "group" to be limited to any particular number of objects.

The prosecution history of the '596 patent confirms that the ordinary meaning of "group" should apply. The inventors principally claimed and argued for patentability of a method involving "*at least two*" macroblocks encoded in frame mode and "*at least two*" macroblocks encoded in field mode. JX-8 ('596 Patent File History) at MOTM_ITC 0000439, 444-447. In other claims, the inventors referred to groups of "*more than two*" and "*four or more*" macroblocks. JX-8 at MOTM_ITC 0000441. The explicitly stated

(and different) qualifications of the number of macroblocks in these latter claims show that "group" is not limited as Microsoft proposes.

Subsequently, all of the claims were rejected in view of U.S. 5,504,430 ("Obikane"), in which frame or field mode was selected for macroblocks individually, allowing any number to be encoded in one mode or the other. JX-8 ('596 Patent File History) at MOTM_ITC 0000452-453; CX-115 at 3:12-21, 8:4-27, 9:62-67; CX-719C (Drabik RWS) at 9-10. The inventors amended their principal claim to clarify that frame or field mode was selected for a group of neighboring macroblocks (as opposed to an individual macroblock), which were also claimed to be arranged for processing into frame macroblocks or field macroblocks as a group. The amended claim did not quantify the number of macroblocks in the group, which was not germane to the issue raised by the Examiner. Indeed, the inventors cancelled their claims to groups of "more than two" and "four or more." JX-8 at MOTM_ITC 0000466-468.

Microsoft argues that "[t]he ['596] patent and its file history are clear that a 'group of neighboring macroblocks' is more than two macroblocks." Resp. Br. at 179-80. Microsoft contends that the term "a group of neighboring macroblocks" was given special meaning and was limited during prosecution to "groups of more than two macroblocks." *Id.* at 179-82. Microsoft's argument is rejected.

Lexicography or disavowal must be clear and unmistakable, and the inventors' use of the terms "group" and "pair" in the patent's description of different embodiments does not amount to a redefinition or disavowal of the ordinary meaning of "group." *Thorner v. Sony Computer Entm't*, 2012 WL 280657, at *2-5 (Fed. Cir. Feb. 1, 2012) (ordinary meaning of "attached" not redefined to mean attached to an outer surface where

the term was used exclusively to describe such embodiments and "embedded" used exclusively to describe embodiments affixed to an internal surface). "Pair" is a narrower term than "group," and there is nothing inconsistent about using "pair" to refer to a group of only two macroblocks. Using "pair" this way does not mean "group" automatically means more than two, as opposed to its broader plain meaning – a collection. *Id.* at *4. Also, consistent with the ordinary meaning of "group" as an unquantified term, the specification adds a qualifier when it refers to a specific number. *See, e.g.*, JX-7 at col. 8, lns. 43-46 ("However, if a *group of four macroblocks* (902), for example, is to be encoded in field mode..."). The term "group" in claim 1 has no such qualification, and it would be improper to read one in from the specification. *Thorner*, 2012 WL 280657, at *4.

Microsoft also argues that there was a prosecution history disclaimer in view of U.S. Patent No. 5,504,430 ("Obikane"). Resp. Br. at 180-82. However, Obikane does ***not*** disclose coding a group of neighboring macroblocks, such as FIG. 7 (a pair of macroblocks) or FIG. 10 (a group of four macroblocks). Instead, Obikane discloses coding individual macroblocks. CX-115 at 3:12-21, 7:22-8:27, 9:62-67; CX-719C (Drabik) 9. Microsoft takes a few words in the amendment out of context and ignores the other changes made. It points to no argument disclaiming a group of two macroblocks, and mischaracterizes the Examiner's reasons for allowance, which did not include "group" in the terms the Examiner emphasizes in italics. JX-8 ('596 Patent File History) at MOTM_ITC 0000488-89; Mitzenmacher Tr. 1616-1628. When viewed as a whole, the claim amendments confirm that the patentee was not disclaiming macroblock pairs. *Compare* JX-8 at MOTM_ITC 0000466 amendments *with* JX-7 col. 7, ln. 32-col. 8, ln.

24. For example, the same amendment added "wherein said frame macroblocks and said field macroblocks are the *same size*." JX-8 at MOTM_ITC 0000466. The "same size" discussion in the specification is specifically in connection with macroblock pairs. JX-7 at col. 7, lns. 43-49.

4. "jointly processing two fields in said group of neighboring macroblocks" (claim 1)

Claim Term	Motorola's Proposed Construction	Microsoft's Proposed Construction
"jointly processing two fields in said group of neighboring macroblocks" (claim 1)	for each macroblock within the group of neighboring macroblocks, processing samples from the two fields of a coded frame	processing both fields "in said group of neighboring macroblocks" together

The claim term "jointly processing two fields in said group of neighboring macroblocks" appears in the first sub-step of the third step of independent claim 1. JX-7 at col. 18, lns. 6-33.[67]

Motorola construes the term to mean "for each macroblock within the group of neighboring macroblocks, processing samples from the two fields of a coded frame." Compls. Br. at 125. Microsoft construes the term to mean "processing both fields 'in said group of neighboring macroblocks' together." RX-394 at 2.

As proposed by Motorola, the claim term "jointly processing two fields in said group of neighboring macroblocks" is construed to mean "for each macroblock within the group of neighboring macroblocks, processing samples from the two fields of a coded frame."

[67] The term also appears in non-asserted claims. JX-7.

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The term "processing" in the disputed claim term "jointly processing two fields in said group of neighboring macroblocks," refers to the processing that occurs if the claimed "group of neighboring macroblocks" is in frame mode.

The '596 patent specification makes this clear:

> The present invention provides a method of adaptive frame/field (AFF) coding of digital video content comprising a stream of pictures or slices of a picture at a macroblock level. The present invention extends the concept of picture level AFF to macroblocks. In AFF coding at a picture level, each picture in a stream of pictures that is to be encoded is encoded in either frame mode or in field mode, regardless of the frame or field coding mode of other pictures that are to be coded. If a picture is encoded in frame mode, the two fields that make up an interlaced frame are coded jointly. Conversely, if a picture is encoded in field mode, the two fields that make up an interlaced frame are coded separately. The encoder determines which type of coding, frame mode coding or field mode coding, is more advantageous for each picture and chooses that type of encoding for the picture. The exact method of choosing between frame mode and field mode is not critical to the present invention and will not be detailed herein.
>
> * * *
>
> To understand macroblock level AFF coding, a brief overview of picture level AFF coding of a stream of pictures will now be given. A frame of an interlaced sequence contains two fields, the top field and the bottom field, which are interleaved and separated in time by a field period. The field period is half the time of a frame period. In picture level AFF coding, the two fields of an interlaced frame can be coded jointly or separately. If they are coded jointly, frame mode coding is used. Conversely, if the two fields are coded separately, field mode coding is used.
>
> * * *

> In the first case, AFF coding is performed on a single macroblock. If the macroblock is to be encoded in frame mode, the two fields in the macroblock are encoded jointly. Once encoded as a frame, the macroblock can be further divided into the smaller blocks of FIGS. 3a-f for use in the temporal prediction with motion compensation algorithm.
>
> * * *
>
> FIG. 7 illustrates an exemplary pair of macroblocks (700) that can be used in AFF coding on a pair of macroblocks according to an embodiment of the present invention. If the pair of macroblocks (700) is to be encoded in frame mode, the pair is coded as two frame-based macroblocks. In each macroblock, the two fields in each of the macroblocks are encoded jointly. Once encoded as frames, the macroblocks can be further divided into the smaller blocks of FIGS. 3a-f for use in the temporal prediction with motion compensation algorithm.

JX-7 at col. 4, lns. 23-40; col. 6, lns. 45-54; col. 7, lns. 5-10; col. 7, lns. 50-59 (emphases added).

As disclosed in the specification portions cited above, the '596 patent repeatedly uses the term "jointly" to refer to an action on both the top and bottom fields of a frame in frame mode. "If a picture is encoded in frame mode, the two fields that make up an interlaced frame are coded jointly." "In picture level AFF coding, the two fields of an interlaced frame can be coded jointly or separately. If they are coded jointly, frame mode coding is used." "In each macroblock, the two fields in each of the macroblocks are encoded jointly."

Thus, the specification makes clear that the claim term "jointly processing two fields in said group of neighboring macroblocks" refers to processing each macroblock in the group during encoding or decoding by processing the top and bottom field samples

that make up that macroblock.

5. "separately processing two fields of said group of neighboring macroblocks" (claim 1)

Claim Term	Motorola's Proposed Construction	Microsoft's Proposed Construction
"separately processing two fields of said group of neighboring macroblocks" (claim 1)	for each macroblock within the group of neighboring macroblocks, processing samples from a single field	processing each of the two fields in "said group of neighboring macroblocks" without involving the other field

The claim term "separately processing two fields of said group of neighboring macroblocks" appears in the second sub-step of the third step of independent claim 1. JX-7 at col. 18, lns. 6-33.[68]

Motorola construes the term to mean "for each macroblock within the group of neighboring macroblocks, processing samples from a single field." Compls. Br. at 125-26. Microsoft construes the term to mean "processing each of the two fields in 'said group of neighboring macroblocks' without involving the other field." RX-394 at 2.

As proposed by Motorola, the claim term "separately processing two fields of said group of neighboring macroblocks" is construed to mean "for each macroblock within the group of neighboring macroblocks, processing samples from a single field."

The term "processing" in the disputed claim term "separately processing two fields of said group of neighboring macroblocks," refers to the processing that occurs if the claimed "group of neighboring macroblocks" is in field mode.

The '596 patent specification makes this clear:

[68] The term also appears in non-asserted claims. JX-7.

The present invention provides a method of adaptive frame/field (AFF) coding of digital video content comprising a stream of pictures or slices of a picture at a macroblock level. The present invention extends the concept of picture level AFF to macroblocks. In AFF coding at a picture level, each picture in a stream of pictures that is to be encoded is encoded in either frame mode or in field mode, regardless of the frame or field coding mode of other pictures that are to be coded. If a picture is encoded in frame mode, the two fields that make up an interlaced frame are coded jointly. Conversely, if a picture is encoded in field mode, the two fields that make up an interlaced frame are coded separately. The encoder determines which type of coding, frame mode coding or field mode coding, is more advantageous for each picture and chooses that type of encoding for the picture. The exact method of choosing between frame mode and field mode is not critical to the present invention and will not be detailed herein.

* * *

To understand macroblock level AFF coding, a brief overview of picture level AFF coding of a stream of pictures will now be given. A frame of an interlaced sequence contains two fields, the top field and the bottom field, which are interleaved and separated in time by a field period. The field period is half the time of a frame period. In picture level AFF coding, the two fields of an interlaced frame can be coded jointly or separately. If they are coded jointly, frame mode coding is used. Conversely, if the two fields are coded separately, field mode coding is used.

* * *

However, if the pair of macroblocks (700) is to be encoded in field mode, it is first split into one top field 16 by 16 pixel block (800) and one bottom field 16 by 16 pixel block (801), as shown in FIG. 8. The two fields are then coded separately.

* * *

> However, if a group of four macroblocks (902), for example, is to be encoded in field mode, it is first split into one top field 32 by 16 pixel block and one bottom field 32 by 16 pixel block. The two fields are then coded separately.

JX-7 at col. 4, lns. 23-40; col. 6, lns. 45-54; col. 7, lns. 60-64; col. 8, lns. 43-46 (emphases added).

As disclosed in the specification portions cited above, the '596 patent repeatedly uses the term "separately" to refer to an action on both the top and bottom fields of a frame in field mode. For example, the specification describes that when encoded in field mode, a pair of macroblocks will be split into a "top field 16 16 pixel block " and a "bottom field 16 16 pixel block, " and then the two fields are "coded separately." Similarly, describing an example of a group of four macroblocks encoded in field mode, the specification discloses that the group of macroblocks will be split into top and bottom fields and then the two fields are coded separately.

6. "said frame or field macroblocks can be divided into blocks, each of said block comprises 16 16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels" (claim 2)

Claim Term	Motorola's Proposed Construction	Microsoft's Proposed Construction
"said frame or field macroblocks can be divided into blocks, each of said block comprises 16 16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels" (claim 2)	the frame macroblocks or field macroblocks can be divided into each of the following block sizes: 16 16, 16 by 8 pixels, 8 by16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels	each of said block comprises one or more of the following alternatives: 16 16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels

The claim term "said frame or field macroblocks can be divided into blocks, each

of said block comprises 16 16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixe ls, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels" appears in dependent claim 2. JX-7 at col. 18, lns. 34-38.[69]

Motorola construes the term to mean "the frame macroblocks or field macroblocks can be divided into each of the following block sizes: 16 16, 1 6 by 8 pixels, 8 by16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels." Compls. Br. at 126. Microsoft construes the term to mean "each of said block comprises one or more of the following alternatives: 16 16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels." RX-394 at 3.

As proposed by Motorola, the claim term "said frame or field macroblocks can be divided into blocks, each of said block comprises 16 16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels" is construed to mean "the frame macroblocks or field macroblocks can be divided into each of the following block sizes: 16 16, 16 by 8 pixels, 8 by16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels."

Claim 2 is a method in which frame macroblocks or field macroblocks can be divided into each of the block sizes listed, *i.e.*, 16 16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels.

The '596 patent specification discloses:

> AFF coding on macroblock pairs will now be explained. AFF coding on macroblock pairs will be occasionally referred to as pair based AFF coding. A comparison of the block sizes in FIGS. 6a-d and in FIGS. 3a-f show that a macroblock encoded in field mode can be divided into

[69] The term also appears in non-asserted claims. JX-7.

> fewer block patterns than can a macroblock encoded in frame mode. The block sizes of 16 by 16 pixels, 8 by 16 pixels, and 8 by 4 pixels are not available for a macroblock encoded in field mode because of the single parity requirement. This implies that the performance of single macroblock based AFF may not be good for some sequences or applications that strongly favor field mode coding. In order to guarantee the performance of field mode macroblock coding, it is preferable in some applications for macroblocks that are coded in field mode to have the same block sizes as macroblocks that are coded in frame mode. This can be achieved by performing AFF coding on macroblock pairs instead of on single macroblocks.

JX-7 at col. 7, lns. 32-49 (emphases added).

The specification states that the problem with AFF coding on a single macroblock is that the block sizes of 16x16 pixels and 8x16 pixels "are not available for a macroblock encoded in field mode because of the single parity requirement." The specification explains that with the invention of AFF coding on macroblock pairs (where the field macroblock is the same size as the frame macroblock), the field macroblock can further be divided into each of the block sizes of FIGS. 3a-f. *Id.* The specification emphasized this benefit, explaining that "it is preferable in some applications for macroblocks that are coded in field mode to have the same block sizes as macroblocks that are coded in frame mode."

B. Infringement Analysis of the '596 Patent

Microsoft argues that it does not directly infringe the '596 patent based on its testing of the Xbox with certain test video clips. Microsoft asserts that Motorola failed to show that Microsoft's test clips possessed the properties necessary to invoke the accused functionality in the allegedly infringing manner and so its evidence of direct infringement is insufficient. Resp. Br. at 177-78. Microsoft's argument is rejected.

Microsoft's assertions that it has never directly infringed the '596 patent ignore its admitted use of the Xbox to decode MBAFF-encoded digital video using the Main and High Profiles of the H.264 Standard. CX-635C at 14. It further ignores Mr. Wu's admissions that Microsoft tested the MBAFF decoding feature of the Xbox. CX-646C (Wu Dep. Tr.) at 23, 43-44. *See* Compls. Br. 127-28. Further, Mr. Wu testified that the bitstreams tested cover the MBAFF feature (CX-646C (Wu Dep. Tr.) at 38, 43-44); Microsoft's test document labels bitstreams as "MB AFF," and several are identified as using "*all combinations of frame and field macroblock pairs*." CX-181C at MS-Moto_752_737906-07.

Microsoft also argues that Motorola improperly relies on the H.264 specification (CX-29) as evidence of infringement. Resp. Br. at 178. Microsoft argues that use of the H.264 Standard as evidence is improper because it only prescribes inputs and outputs. *Id.* However, the Standard requires that "[e]ach profile specifies a subset of algorithmic features and limits that *shall be supported by all decoders conforming to that profile*. CX-29 at 286 (emphasis added). Microsoft does not deny that they practice the H.264 Standard and that the Standard requires this.

1. Accused Products

Motorola argues that at least the following products are accused products: all versions and configurations of the Microsoft Xbox 360 console imported into the United States and/or sold after importation into the United States on or after December 17, 2010, including but not limited to the Xbox 360 4 GB Console and the Xbox 360 250 GB Console. Compls. Br. at 127 citing CX-706C (Drabik WS) at 6, 381.

Microsoft does not dispute this.

2. Direct Infringement

For the reasons set forth below, Motorola has shown that Microsoft's accused products infringe all asserted claims of the '596 patent.

Claim 1

The preamble of independent method claim 1 recites:

> **A method of encoding or decoding digital video content, said digital video content comprising a stream of pictures which can each be intra, predicted, or bi-predicted pictures, each of said pictures comprising macroblocks, said method comprising the steps of:**

Motorola has established that this claim limitation is satisfied.

The claim term "macroblock" has been construed to mean "a rectangular group of pixels."

The preamble recites "encoding or decoding" in the alternative, requiring either encoding *or decoding*. Mitzenmacher Tr. 1589. The Xbox decodes digital video content. *Id.* at 1588-89. Specifically, in compliance with the H.264 Standard, the Xbox decodes digital video content comprising a stream of pictures which can be intra, predicted, or bi-predicted pictures, each of said pictures comprising macroblocks. The H.264 Standard specifies two coding types, intra coding and inter coding (which includes predictive and bi-predictive). CX-29 at 3, 129-174; CX-706C (Drabik WS) at 396. The H.264 Standard further specifies that a picture comprises macroblocks. CX-29 at 24 ("Pictures are divided into slices. A slice is a sequence of macroblocks, or, when macroblock-adaptive frame/field decoding is in use, a sequence of macroblock pairs."); *see* CX-706C (Drabik WS) at 396.

Relevant operations for decoding digital video content according to the preamble

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are found throughout Microsoft's source code. In particular,

[ ] decodes intra macroblocks within an intra picture, predicted picture, or bi-predicted picture. CX-334C at MS-MOTO_752_0005129630-31; CX-706C (Drabik WS) at 396. Dr. Drabik's operation of the Xbox also confirmed this operation. CX-706C (Drabik WS) at 385-396.

Microsoft does not dispute that the Xbox operates in the above manner. Instead, it argues that the Xbox does not decode "macroblocks" because it processes [ ] and not pixels. However, the Xbox does decode macroblocks when it processes [ ] Microsoft's own documents show that the Xbox engineers use the words [ ] interchangeably and even in combination [ ]. CX-799 at 10. Microsoft's expert admitted that luma corresponds to the brightness component of a pixel, and chroma corresponds to its color. Mitzenmacher Tr. 1590-1591. Nothing in the specification of the '596 patent distinguishes "pixels" from their luma and chroma components. *Id.* at 1591-1592. Moreover, claim 1 does not require color pixels. *Id.* at 1598. In a monochrome picture, each pixel is represented only with luma. *Id.* at 1596-1597. The decoder therefore does not need to process chroma components in order to process a "pixel" of a monochrome picture. Microsoft concedes that the Xbox is capable of decoding monochrome pictures. *Id.*

The first step of claim 1 recites:

> **selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode;**

Motorola has established that this claim limitation is satisfied.

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The claim term "selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode" has been construed to mean "choosing which mode, frame mode or field mode, to use in encoding or decoding a group of neighboring macroblocks." Further, the undersigned determined that the claim term "group of neighboring macroblocks" need not be construed.

In compliance with the H.264 Standard, when the Xbox decodes an MBAFF-encoded video, it selects to decode a group of neighboring macroblocks in a frame mode or a field mode. CX-706C (Drabik WS) at 398-410; Drabik Tr. 568. For example, a group of neighboring macroblocks can be a macroblock pair. The H.264 Standard states that:

> When macroblock-adaptive frame/field decoding is in use, the picture is partitioned into slices containing an integer number of macroblock pairs as shown in Figure 6-8. Each macroblock pair consists of two macroblocks.

CX-29 at 25. Figure 6-8 of the H.264 Standard shows the partitioning of a picture into macroblock pairs (*Id.*):

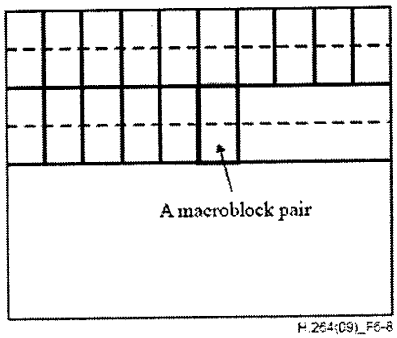

Figure 6-8 – Partitioning of the decoded frame into macroblock pairs

The Main and High profiles of the H.264 Standard require a decoder to be able to read an "mb_field_decoding_flag" from the bitstream. Wang Tr. 399-400. According to the

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H.264 Standard, each macroblock pair has an associated mb_field_decoding_flag that the decoder reads when choosing which mode (frame or field), to use in the decoding process. CX-29 at 96. Microsoft admits that the Xbox supports the MBAFF decoding process defined in the H.264 Standard. CX-646C (Wu Dep. Tr.) at 21-22. Mr. Wu testified that the decoder in Microsoft's Xbox implements the decoding process for frame and field macroblocks as it is defined in the H.264 Standard. CX-646C (Wu Dep. Tr.) at 29-30, 32-33.

Microsoft's source code confirms that the Xbox selects to decode a group of neighboring macroblocks in a frame mode or a field mode. The Xbox decoder [

] respectively, [

] This variable indicates to later functions to decode a picture as an MBAFF picture. CX-330C at MS-MOTO_752_0005129702; CX-706C (Drabik WS) at 402-405; Mitzenmacher Tr. 1599-1600.

For each macroblock pair, the [

] Mitzenmacher Tr. 1600. For example, [

] CX-334C at MS-MOTO_752_0005129619. The Xbox then selects (chooses) to decode in frame mode or field mode [ ] throughout the decoding process. *See, e.g.*, CX-

234C at MS-MOTO_752_0000980390; CX-706C (Drabik WS) at 405-409. Dr. Drabik's operation of the Xbox confirmed that the Xbox performs the "selecting" step. The screenshots (CX-193) he analyzed show the status of the MBAFF flags and that the picture contains frame macroblock pairs and field macroblock pairs. By playing the video, Dr. Drabik confirmed that the Xbox decodes such pairs in a frame mode or field mode [ ] CX-706C (Drabik WS) at 385-395, 401.

Microsoft does not dispute the above-discussed operation of the Xbox. Instead, it argues that a pair of macroblocks is not a "group of neighboring macroblocks" relying on its proposed claim construction. However, the undersigned determined that the claim term "group of neighboring macroblocks" need not be construed to have anything other than its ordinary meaning, and thus the claimed "group of neighboring macroblocks" can include two macroblocks. *See* FIG. 7 embodiment of the '596 patent.

Microsoft further argues that the claimed "selecting" is done only by an encoder, and that the Xbox decoder does no selecting because it just follows instructions from the encoder. This is not correct. First, the claim recites "selecting to encode ***or decode***...in a frame mode or field mode." Second, the Xbox decoder does not simply follow instructions. As discussed above, the Xbox decoder [

] and [ ] It then selects (chooses) which parts of the code to execute [ ] For example, the Xbox decoder selects whether to [ ] in frame mode or in field mode [

] CDX-2-10 to 12; CX-706C (Drabik WS) at 409.

Microsoft's expert agreed that [ ] determines some of the code being run in the process of decoding." Mitzenmacher Tr. 1601.

The second step of claim 1 recites:

> **arranging said group of neighboring macroblocks for processing into frame macroblocks or field macroblocks according to the selected one of said frame mode or said field mode; and**

Motorola has established that this claim limitation is satisfied.

The undersigned determined that the claim term "group of neighboring macroblocks" need not be construed.

In compliance with the H.264 Standard, the Xbox arranges the group of neighboring macroblocks for processing into frame macroblocks or field macroblocks according to the selected one of said frame mode or said field mode. CX-706C (Drabik WS) at 410-416. The H.264 Standard specifies as part of the picture construction process that macroblocks of macroblock pairs are arranged to form a picture. CX-29 at 191-192. Equation 8-411 describes how the lines of each field macroblock in a pair are spread out vertically so that lines from top and bottom field macroblocks are interleaved. Equation 8-412 describes how lines of each frame macroblock in a pair are moved into adjacent line locations of frame macroblocks in the reconstructed picture.[70] *Id.* By arranging the lines on the basis of whether the macroblocks are frame macroblocks or field macroblocks, the H.264 Standard requires performance of this step.

[70] The H.264 Standard also specifies equations for arranging the corresponding chroma samples of each pixel in a macroblock. *See* CX-29 at 192 (8-415 and 8-416); Drabik Tr. 657.

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This operation is confirmed in Microsoft's source code. For example, [

] perform the "arranging" required by this claim step. *See* CX-294C, CX-309C, CX-310C, and CX-312C. Through these processes, the field macroblock pairs are arranged (ordered) into frame macroblocks by interleaving top and bottom field lines of the macroblock pair to form frame macroblocks in the picture construction process. The frame macroblock pairs are arranged (ordered) into frame macroblocks by moving adjacent lines of the macroblocks into adjacent lines of frame macroblocks in the reconstructed picture. In both cases, the arranging is done in the source code [ ] CX-706C (Drabik WS) at 411-416. Dr. Drabik's operation of the Xbox confirmed that the Xbox performs the "arranging" step. The screenshots he analyzed (CX-193) show macroblocks that were received by the Xbox as frame macroblock pairs or field macroblock pairs, and playing the video confirmed that the Xbox arranges such pairs into frame macroblocks [ ] CX-706C (Drabik WS) at 385-395, 411.

Microsoft does not dispute that the Xbox reshuffles (orders) according to [ ] Instead, Microsoft makes a series of claim construction arguments that attempt to limit the "arranging" step to the encoding direction only. Microsoft argues that there is no "arranging" of a group of neighboring macroblocks in the Xbox because the input to the "arranging" step is two frame or field macroblocks, not a pair of macroblocks. However, the Xbox receives a *pair* of frame macroblocks or a *pair* of field macroblocks. Dr. Mitzenmacher admitted that the input to the MBAFF decoding process is a pair of frame macroblocks or a pair of field macroblocks. *See, e.g.,* Mitzenmacher Tr. 1635;

RRX-007C at 69 ("...the Xbox receives a pair of frame macroblocks or a pair of frame [sic] macroblocks."); RRDX-26 (depicting a pair of frame macroblocks or a pair of field macroblocks as the input to the MBAFF decoding process). Both Dr. Mitzenmacher and Mr. Wu admit that the mb_field_decoding_flag in the input bitstream refers to a *pair* of macroblocks. Mitzenmacher Tr. 1606; CX-646C (Wu Dep. Tr.) at 29-30. The Xbox's [ ] discussed above then arrange these *pairs* into frame macroblocks.

Microsoft also argues that there is no "arranging" of a group of neighboring macroblocks in the Xbox because the output of the "arranging" step is a "pair of macroblocks," not "frame macroblocks." However, the '596 patent discusses that a "macroblock pair" can be two frame macroblocks. *See, e.g.,* JX-7 at col. 16, lns. 35-41 ("bottom-frame macroblock (176) of the above macroblock pair (170)"); col. 16, lns. 59-65 (to "top-frame macroblock (175) of the left macroblock pair (172)"). Thus, the "pair of macroblocks" illustrated on the left side of FIG. 8 is two frame macroblocks: a top frame macroblock and a bottom frame macroblock. FIG. 8 illustrates that the "pair of macroblocks" is actually two frame macroblocks by using a bold line to separate the top frame macroblock of the pair from the bottom frame macroblock of the pair. *See, e.g.,* CDX-2-22 (emphasizing bold line).

Microsoft further argues that there is no "arranging" of a group of neighboring macroblocks in the Xbox because the Xbox does not arrange "into field macroblocks." However, the claim language is "arranging said group ... into frame macroblocks ***or*** field macroblocks." The claim does not require arranging the group into frame macroblocks ***and*** arranging the group into field macroblocks. As discussed above, this step is performed when the Xbox's [ ] arrange a pair of field macroblocks into

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frame macroblocks or a pair of frame macroblocks into frame macroblocks.

Finally, Microsoft argues that there is no "arranging" of the group of neighboring macroblocks in the Xbox because the Xbox does not arrange "according to the selected one of said frame mode or said field mode." However, as discussed above, the Xbox's [ ] order the group of neighboring macroblocks differently [ ]

The third step of claim 1 recites:

> **encoding or decoding said frame macroblocks or said field macroblocks, wherein, the step of arranging said group of neighboring macroblocks for processing into frame macroblocks or field macroblocks includes the step of:**
>
> > **in frame mode, jointly processing two fields in said group of neighboring macroblocks, said group of neighboring macroblocks being divided into frame macroblocks, and each of said frame macroblocks including both top and bottom field pixels;**
> >
> > **in said field mode, separately processing two fields of said group of neighboring macroblocks, said group of neighboring macroblocks being split into field macroblocks, and each of said field macroblocks including either top or bottom field pixels, and wherein said frame macroblocks and said field macroblocks are the same size.**

Motorola has established that this claim limitation is satisfied.

"encoding or decoding"

In compliance with the H.264 Standard, the Xbox decodes the frame or field macroblocks. CX-706C (Drabik WS) at 416-420. According to the H.264 Standard, each macroblock of the macroblock pair is decoded in a frame mode or field mode. CX-

29 at 109. Mr. Wu confirmed that the Xbox decodes a frame or field macroblock pair according to the H.264 Standard. CX-646C (Wu Dep. Tr.) at 31, 33.

Microsoft's source code further confirms the operation of the Xbox decoder. Decoding operations can be found throughout Microsoft's source code. For example, [

] to decode intra-coded frame or field macroblocks. CX-334C at MS-MOTO_752_0005129630-31, MS-MOTO_752_0005129627-28; CX-706C (Drabik WS) at 417-20. Dr. Drabik's operation of the Xbox confirmed that the Xbox decodes the frame or field macroblocks. CX-706C (Drabik WS) at 385-95, 417.

Microsoft argues that there is no "encoding or decoding said frame macroblocks or said field macroblocks" because the Xbox operates [ ] instead of pixels. As discussed above, the Xbox decodes "macroblocks" by decoding the [ ]

"in frame mode, jointly processing"

The claim term "jointly processing two fields in said group of neighboring macroblocks" has been construed to mean "for each macroblock within the group of neighboring macroblocks, processing samples from the two fields of a coded frame."

In compliance with the H.264 Standard, in frame mode, the Xbox jointly processes two fields in the group of neighboring macroblocks. CX-706C (Drabik WS) at 420-34. During the H.264 decoding process, each macroblock of a frame macroblock pair has samples from two fields and those samples are processed together. CX-29 at 8. During processing, the frame macroblock pair is in the state of being divided into frame

macroblocks. *Id.* ("**frame macroblock pair**: A *macroblock pair* decoded as two *frame macroblocks*"). Each frame macroblock includes both top and bottom field pixels. *Id.* ("**frame macroblock:** A *macroblock* representing samples from the two *fields* of a *coded frame*."). The top macroblock is decoded first, followed by the bottom macroblock.[71]

The Xbox source code confirms that the Xbox jointly processes both fields in the group of neighboring macroblocks. For example, after a macroblock pair is arranged into frame macroblocks, each frame macroblock contains pixels from both fields. Each frame macroblock is then processed in a filtering step called "deblocking." In the Xbox, this processing occurs [ ] [

] Mitzenmacher Tr. 1646. [

] CX-234C at MS-MOTO_752_0000980390-394, MS-MOTO_752_0000980402-403. CX-706C (Drabik WS) at 422-26.

[71] The '596 patent explains that with AFF coding on macroblock pairs, the top macroblock is coded first followed by the bottom macroblock. JX-7 at col. 8, lns. 20-24. The Xbox source code decodes macroblock pairs in the same way (*i.e.*, top macroblock first followed by bottom macroblock). *See, e.g.*, CX-334C at MS-MOTO_752_0005129630-31 [ ] CX-706C (Drabik WS) at 418-19.

The Xbox source code also jointly processes both fields in the group of neighboring macroblocks when performing prediction of a macroblock in intra 16 16 mode. After a macroblock pair is arranged into frame macroblocks, each frame macroblock can then be processed in a prediction step called "DC" prediction. In the Xbox, this occurs in [ ] In this [

] Drabik Tr. 650-651; CX-331C at MS-MOTO_752_0005129488-89; CX-706C (Drabik WS) at 428-429. Dr. Drabik's operation of the Xbox confirmed that the Xbox performs the "jointly processing" of claim 1. Dr. Drabik's analysis of the screenshots (CX-193) showed that the picture contained frame macroblock pairs that were predicted in intra 16 16 mode. In order to decode the frame macroblock pairs, the Xbox had to perform "jointly processing." CX-706C (Drabik WS) at 385-395, 422.

"in said field mode, separately processing"

The claim term "separately processing two fields of said group of neighboring macroblocks" has been construed to mean "for each macroblock within the group of neighboring macroblocks, processing samples from a single field."

The claim language recites that "arranging ... for processing ... includes the ***step*** of." This language refers to a single "step," indicating that only one of "jointly processing..." or "separately processing..." is required. In any event, the Xbox also performs "separately processing." In compliance with the H.264 Standard, in field mode, the Xbox separately processes two fields of the group of neighboring macroblocks.

During the H.264 decoding process, each macroblock of a field macroblock pair has samples from only a single field and those samples are processed separately. CX-29 at 8. During processing, the field macroblock pair is in the state of being split into field macroblocks. *Id.* ("**field macroblock pair**: A *macroblock pair* decoded as two *field macroblocks*."). Each of the field macroblocks includes either top or bottom field pixels. *Id.* ("**field macroblock**: A *macroblock* containing samples from a single *field*."). The top macroblock is decoded first, followed by the bottom macroblock.

The Xbox source code confirms that the Xbox separately processes each field in the group of neighboring macroblocks. In the Xbox, this occurs in [

] Mitzenmacher Tr. 1646. [

] CX-706C (Drabik WS) at 431.

Dr. Mitzenmacher admits that for a field macroblock, [

] Mitzenmacher Tr. 1645. [

] separately [

] CX-234C at MS-MOTO_752_0000980390-394; MS-MOTO_752_0000980402; CX-706C (Drabik WS) at 430-31.

The Xbox source code also separately processes both fields in the group of neighboring macroblocks when performing prediction of a macroblock in intra 16 16

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mode. [

] CX-331C at MS-MOTO_752_0005129488-89; CX-706C (Drabik WS) at 429-30.

Claim 2

Dependent claim 2 recites:

> **The method of claim 1, wherein said frame or field macroblocks can be divided into blocks, and each of said block comprises 16x16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels.**

Motorola has established that the limitations of claim 2 are satisfied.

The claim term "said frame or field macroblocks can be divided into blocks, each of said block comprises 16 16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels" has been construed to mean "the frame macroblocks or field macroblocks can be divided into each of the following block sizes: 16 16, 16 by 8 pixels, 8 by16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels."

In compliance with the H.264 Standard, the Xbox must be able to decode macroblocks that have been partitioned into each of the seven block sizes 16 16 pixels, 16 8 pixels, 8 16 pixels, 8 8 pixels, 8 4 pixels, 4 8 pixels, or 4 4 pixels. CX -706C (Drabik WS) at 434-36, 439. The H.264 Standard states that: "Macroblocks or sub-

macroblocks may be partitioned, and the partitions are scanned for inter prediction as shown in FIG. 6-9." CX-29 at 26. FIG. 6-9 shows that the frame macroblocks or field macroblocks can be divided into each of the seven block sizes. CX-29 at 26; *see also* CX-29 at 105-07.

The Xbox source code includes functions that operate on each of the seven block sizes. Examples of operating on different block sizes are found throughout the source code. One such example is the file

[ ] (CX-328C). CX-706C (Drabik WS) at 436. In addition, Dr. Drabik's operation of the Xbox confirmed that the

[ ] CX-706C (Drabik WS) at 385-95; Drabik Tr. 662-664; 666.

3. Indirect Infringement

Motorola has not shown that Microsoft's accused products indirectly infringe all asserted claims of the '596 patent.

Motorola argues that Microsoft induces and contributes to the infringement as a result of the direct infringement by users of the Xbox (including Microsoft when it tests the Xbox devices). Compls. Br. at 128-29.

Microsoft argues that Motorola has not established certain required elements of induced infringement and contributory infringement. Resp. Br. at 176-77.

Inducement requires specific intent to encourage another's infringement. *Ricoh*, 550 F.3d at 1341. Generic product usage instructions do not establish intent because the relevant question is whether "instructions teach *an infringing use* of the device such that we are willing to infer from those instructions an affirmative intent to infringe the

patent." *Vita-Mix*, 581 F.3d at 1329 n.2 (emphasis added).

Microsoft does not instruct its customers to use the Xbox to watch H.264 interlaced content. Motorola points to Microsoft's generic product usage instructions, including passages showing how Xbox connects to a TV. CX-706C (Drabik WS) at Q448, Q912 (citing CX-182). These instructions do not instruct users to play video that invokes the accused features. RRX-7C (Mitzenmacher RWS) at 87-88, 203-204. Motorola also relies on a Microsoft website that references Xbox's ability to decode H.264 video. CX-706C (Drabik WS) at Q449, 913 (citing CX-179). That website describes H.264 in general, but not the interlaced H.264 content at issue here. RRX-7C (Mitzenmacher RWS) at 88-89, 204-205.

Motorola's allegation of contributory infringement fails because Xbox has substantial non-infringing uses. *Vita-Mix*, 581 F.3d at 1327-1328. None of Xbox's uses that were discussed during the investigation uses the accused features, including video games, (RX-386C (Thumpudi WS) at 2-3), non-H.264 video formats, (RRX-7C (Mitzenmacher RWS) at 88-89, 204-205, citing CX-179), and progressive H.264 content. RX-386C (Thumpudi WS) at 3.

C. Validity of the '596 Patent

1. RX-18 ("the Puri article"); RX-20 ("MPEG-4 draft specification"); RX-332 ("the '878 patent"); and RX-294 ("VCEG-N76")

For the reasons set forth below, Microsoft has shown by clear and convincing evidence that independent claim 1 of the '596 patent is invalid. However, Microsoft has not shown by clear and convincing evidence that dependent claim 2 of the '596 patent is invalid.

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Claim 1

Each of the references RX-18, RX-20, RX-332, and RX-294, anticipates claim 1 of the '596 patent. Each qualifies as a printed publication under Section 102(a) or 102(b). *See* JX-11 (Joint Stipulation), ¶ 9.

Microsoft argues that its expert, Dr. Orchard, explained how each prior art reference discloses every limitation of claim 1, and other than the "macroblock" element, Motorola does not dispute this disclosure. Resp. Br. at 188 (citing Compls. P.H. Br. at 152-53). Motorola's post-hearing brief confirms this. Compls. Br. at 150-58.

RX-20 (MPEG-4 draft specification) discloses the preamble by describing digital video coding and decoding method; first step: "selecting to encode or decode … in frame mode or field mode" by describing a method that selects between frame mode and field mode; second step: "arranging said group of neighboring macroblocks …" by its disclosure of arranging four 8x8 macroblocks; third step: "encoding or decoding said frame macroblocks or said field macroblocks"; third step:"wherein, the step of …"; first sub-step of third step: "in frame mode, jointly processing …"; second sub-step of third step: "in field mode, separately processing …"; second sub-step of third step:"wherein said frame macroblocks …". RX-316C (Orchard WS) at 20-28.

Likewise, RX-18 (Puri article) discloses the preamble and each of the three claim steps of claim 1. *Id.* at 31-40.

Also, RX-332 ('878 patent) discloses the preamble and each of the three claim steps of claim 1. *Id.* at 45-50.

Finally, RX-294 (VCEG-N76) discloses the preamble and each of the three claim steps of claim 1. *Id.* at 56-62.

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For every claim element and for each prior art reference, Dr. Drabik distinguished claim 1 solely because the reference supposedly did not disclose processing a 16x16 pixel macroblock. *See* CX-719C (Drabik RWS) at 17, 34, 46, 62-63; Compls. P.H. Br. at 154-56, 158-60, 162-65, 167-69.

Dr. Drabik applied the wrong legal standard and the wrong claim construction. Dr. Drabik testified that he interpreted "macroblock" as a 16x16 pixel region because "each of the four references relied on by Prof. Orchard … actually define 'macroblock' (as a 16x16 pixel region)." CX-719C (Drabik RWS) at 15-16. But claims are construed based on the patent they appear in, not the prior art alleged to invalidate them. "[A] determination of anticipation, as well as obviousness, involves two steps. First is construing the claim, a question of law for the court, followed by, in the case of anticipation or obviousness, a comparison of the construed claim to the prior art." *Key Pharmaceuticals v. Hercon Laboratories Corp.*, 161 F.3d 709, 714 (Fed. Cir. 1998). One must apply the construction from '596 patent to the prior art, even if the prior art defines terms differently because anticipation "is not an 'ipsissimis verbis' [in the identical words] test." *In re Bond*, 910 F.2d at 832.

The administrative law judge has construed the claim term "macroblock" to mean "a rectangular group of pixels."

Under this claim construction of "macroblock," *i.e.*, "a rectangular group of pixels," Dr. Drabik would have needed to determine whether the macroblocks and field macroblocks identified by Dr. Orchard were "rectangular group[s] of pixels. Motorola does not dispute that they are. At the hearing, Dr. Drabik testified that the regions identified by Dr. Orchard were a rectangular groups of pixels for each prior art reference.

Drabik Tr. 2358-60 (RX-20); *id.* 2360-62 (RX-18); *id.* 2362-64 (RX-332); *id.* 2366-71 (RX-294).

Accordingly, Microsoft has shown by clear and convincing evidence that RX-18, RX-20, RX-332, and RX-294 anticipate claim 1 of the '596 patent.

Claim 2

Dependent claim 2 recites:

> **The method of claim 1, wherein said frame or field macroblocks can be divided into blocks, and each of said block comprises 16x16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels.**

Microsoft argues that RX-18, RX-332, and RX-294 disclose every limitation of claim 2. Resp. Br. at 192. Microsoft's argument relies on its proposed claim construction being adopted by the administrative law judge. Resp. Br. 192-93.

However, as proposed by Motorola, the disputed claim term "said frame or field macroblocks can be divided into blocks, each of said block comprises 16 16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels" has been construed to mean "the frame macroblocks or field macroblocks can be divided into each of the following block sizes: 16 16, 16 by 8 pixels, 8 by16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels."

Accordingly, Microsoft has not shown by clear and convincing evidence that each of the references RX-18, RX-332, and RX-294, anticipates claim 2 of the '596 patent.

2. Indefiniteness

Claims 1 and 2 are supported by the disclosure of the '596 patent. The written description of the '596 patent adequately describes each of the claimed methods.

One of skill in the art further would recognize that the inventors possessed the idea of "encoding or decoding digital video content, said digital video content comprising a stream of pictures which can each be intra, predicted, or bi–predicted pictures, each of said pictures comprising macroblocks." *See, e.g.*, JX-7 at col. 2, lns. 59-63; col. 4, lns. 60-64. Decoders and the decoding process are referenced throughout '596 patent specification. *See, e.g.*, JX-7 at col. 1, lns. 22-23, 30-39, col. 1, ln. 65 – col. 2, ln. 6; col. 2, lns. 59-67; col. 4, ln. 63 – col. 5, ln. 9; col. 7, lns. 43-52; col. 8, ln. 62 – col. 9, ln. 4; col. 12, ln. 62 – col. 13, ln. 16; col. 14, ln. 44 – col. 16, ln. 7; col. 16, ln. 8 – col. 17, ln. 9; *see also* CX-719C (Drabik RWS) at 67-69.

One of skill in the art also would recognize that the inventors possessed the idea of "selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode." As an embodiment of the present invention, the '596 specification discloses AFF coding on a *pair* of macroblocks. FIG. 7 (element 700) of the '596 patent shows a pair of macroblocks that can be used in AFF coding. For AFF coding on macroblock pairs, a frame/field flag is preferably included before each pair of macroblocks to indicate which mode, frame mode or field mode, is used in the coding process. JX-7 at col. 8, ln. 52-col. 9, ln. 4; CX-719C (Drabik RWS) at 70-72.

Finally, one of skill in the art would recognize that the inventors possessed the idea of "encoding or decoding said frame macroblocks or said field macroblocks" according to the '596 patent. As discussed above, the '596 specification describes both

the encoding and decoding processes. In addition, the specification provides detail on the encoding and decoding processes, including detail on temporal and spatial prediction in the context of the '596 patent. *See, e.g.*, JX-7 at col. 9, ln. 44-col. 17, ln. 39; *see also* CX-719C (Drabik RWS) at 72.

Microsoft fails to meet its burden of proving section 112 invalidity. Microsoft argues the patent does not describe "selecting" in connection with decoding. Resp. Br. At 193-94. However, as indicated above, '596 patent describes how the frame/field flag is used in "coding," a term which refers to both encoding and decoding. JX-7 at col. 8, ln. 1 – col. 9, ln. 4; Drabik Tr. 2378-79. As discussed above, Microsoft's argument that the patent does not disclose "decoding" is also without merit.

D. Domestic Industry (Technical Prong)

Motorola's domestic industry products are VIP12XX series of set-top boxes. The VIP12XX series of set-top boxes include the VIP1200, VIP1208, VIP1216, and VIP1225. CX-106C at MOTM_ITC 0020359; CX-706C (Drabik WS) 451-452.

For the reasons set forth below, Motorola has satisfied the technical prong of the domestic industry requirement with respect to the '596 patent.

Claim 1

The preamble of independent method claim 1 recites:

> **A method of encoding or decoding digital video content, said digital video content comprising a stream of pictures which can each be intra, predicted, or bi-predicted pictures, each of said pictures comprising macroblocks, said method comprising the steps of:**

Motorola has satisfied the preamble.

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The claim term "macroblock" has been construed to mean "a rectangular group of pixels."

The preamble recites "encoding or decoding" in the alternative, requiring either encoding *or* decoding. Mitzenmacher Tr. 1589. In compliance with the H.264 Standard, the VIP12XX decodes digital video content comprising a stream of pictures which can be intra, predicted, or bi-predicted pictures, each of said pictures comprising macroblocks. CX-29 at 3, 24; CX-706C (Drabik WS) at 457. Dr. Drabik's observation of the VIP12XX confirmed that the VIP12XX decodes and plays digital video content. CX-706C (Drabik WS) at 457; CX-193.

Microsoft argues that the VIP12XX does not decode "macroblocks" because it [ ] This argument is incorrect for the same reasons discussed above with respect to infringement.

The first step of claim 1 recites:

> **selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode;**

Motorola has satisfied this claim step.

The claim term "selecting to encode or decode a group of neighboring macroblocks in a frame mode or a field mode" has been construed to mean "choosing which mode, frame mode or field mode, to use in encoding or decoding a group of neighboring macroblocks." Further, the undersigned determined that the claim term "group of neighboring macroblocks" need not be construed.

In compliance with the H.264 Standard, when the VIP12XX decodes an H.264 video that is MBAFF-encoded, it selects to decode a group of neighboring macroblocks

in a frame mode or a field mode. CX-29 at 25, 96; CX-706C (Drabik WS) at 458-60; Drabik Tr. 438. Dr. Drabik's observation of the VIP12XX confirmed that the VIP12XX selects to decode a group of neighboring macroblocks in a frame mode or field mode. CX-706C (Drabik WS) at 459; CX-193.

The manual for the SMP8634 chip used in the VIP12XX set-top box confirms that the chip selects to decode a group of neighboring macroblocks in a frame mode or a field mode. Specifically, [

]

CX-214C at SIGMA_0000575.

Microsoft argues that (1) a pair of macroblocks is not a "group of macroblocks;" (2) the claimed "selecting" is done only in an encoder because a decoder just follows instructions from the encoder; and (3) luma and chroma components are not "pixels." These claim construction arguments are not correct for the reasons described above with respect to infringement.

The second step of claim 1 recites:

> **arranging said group of neighboring macroblocks for processing into frame macroblocks or field macroblocks according to the selected one of said frame mode or said field mode; and**

Motorola has satisfied this claim step.

The undersigned determined that the claim term "group of neighboring macroblocks" need not be construed.

In compliance with the H.264 Standard, the VIP12XX arranges macroblock pairs for processing into frame macroblocks or field macroblocks according to the selected one

of said frame mode or said field mode as part of the picture construction process. CX-29 at 191-192; CX-706C (Drabik WS) at 460-62. Dr. Drabik's observation of the VIP12XX confirmed that the VIP12XX arranges said group of neighboring macroblocks for processing into frame macroblocks according to the selected one of said frame mode or said field mode. CX-706C (Drabik WS) at 461; CX-193.

The SMP8634 manual confirms that the SMP8634 meets this limitation. For example, the manual indicates that, [

] CX-214C at SIGMA_0000627 [

]

Microsoft argues that there is no "arranging" of a group of neighboring macroblocks in the VIP12XX for the same reasons it argued with respect to the Xbox. This claim construction argument is again incorrect for the same reasons as discussed above with respect to infringement. Specifically with respect to the VIP12XX, Microsoft argues that the field macroblocks are not arranged into frame macroblocks because they are merely [ ]. This is a distinction without a difference. When a field macroblock is [ ], it becomes a frame macroblock.

The third step of claim 1 recites:

> **encoding or decoding said frame macroblocks or said field macroblocks, wherein, the step of arranging said group of neighboring macroblocks**

for processing into frame macroblocks or field macroblocks includes the step of:

in frame mode, jointly processing two fields in said group of neighboring macroblocks, said group of neighboring macroblocks being divided into frame macroblocks, and each of said frame macroblocks including both top and bottom field pixels;

in said field mode, separately processing two fields of said group of neighboring macroblocks, said group of neighboring macroblocks being split into field macroblocks, and each of said field macroblocks including either top or bottom field pixels, and wherein said frame macroblocks and said field macroblocks are the same size.

Motorola has satisfied this claim step.

"encoding or decoding"

In compliance with the H.264 Standard, the VIP12XX decodes the frame or field macroblocks. CX-29 at 109; CX-706C (Drabik WS) at 462-63. Dr. Drabik's observation of the VIP12XX confirmed that the VIP12XX decodes frame macroblocks and field macroblocks. CX-706C (Drabik WS) at 463; CX-193.

The SMP8634 manual confirms that the SMP8634 used in the VIP12XX set-top box decodes said frame or field macroblocks. The manual indicates that the SMP8634 performs motion compensation on frame or field macroblocks. CX-214C at SIGMA_0000584-0000585.

"in frame mode, jointly processing"

The claim term "jointly processing two fields in said group of neighboring macroblocks" has been construed to mean "for each macroblock within the group of neighboring macroblocks, processing samples from the two fields of a coded frame."

In compliance with the H.264 Standard, in frame mode, the VIP12XX jointly processes two fields in the group of neighboring macroblocks. CX-706C (Drabik WS) at 463-68. During the H.264 decoding process, each macroblock of a frame macroblock pair has samples from two fields and those samples are processed together. CX-29 at 8. During processing, the frame macroblock pair is in the state of being divided into frame macroblocks. *Id.* Each frame macroblock includes both top and bottom field pixels. *Id.* The top macroblock is decoded first, followed by the bottom macroblock.

The SMP8634 manual confirms that the VIP12XX jointly processes both fields in the group of neighboring macroblocks when performing prediction of a macroblock in intra 16 16 mode. In the VIP12XX, this happens in the [ ]. CX-214C at SIGMA_0000580. [ ] is used when the [ ] is equal to zero, indicating that the macroblocks are in a frame macroblock pair. *Id.*

"in said field mode, separately processing"

The claim term "separately processing two fields of said group of neighboring macroblocks" has been construed to mean "for each macroblock within the group of neighboring macroblocks, processing samples from a single field."

In compliance with the H.264 Standard, in field mode, the VIP12XX separately processes each field in the group of neighboring macroblocks when performing prediction of a macroblock in intra 16 16 mode. CX -706C (Drabik WS) at 465-66. During the H.264 decoding process, each macroblock of a field macroblock pair has samples from only a single field and those samples are processed separately. CX-29 at 8. During processing, the field macroblock pair is in the state of being split into field

macroblocks. *Id.* Each of the field macroblocks includes either top or bottom field pixels. *Id.* The top macroblock is decoded first, followed by the bottom macroblock.

The SMP8634 manual confirms that the chip separately processes two fields in said group of neighboring macroblocks. In the VIP12XX, this happens in the [ ] module. CX-214C at SIGMA_0000580. [ ] is used when the [ ] is equal to one, indicating that the macroblocks are in a field macroblock pair. *Id.*

Dr. Drabik's operation of the VIP12XX confirmed that the VIP12XX performs the jointly and separately processing of claim 1. CX-706C (Drabik WS) at 464, 466; CX-193.

Microsoft's arguments that there is no "jointly processing" or "separately processing" in the VIP12XX are not correct for the reasons discussed above with respect to infringement.

Finally, the VIP12XX operates such that the frame macroblocks and the field macroblocks are the same size. CX-706C (Drabik WS) at 467.

Claim 2

Dependent claim 2 recites:

> **The method of claim 1, wherein said frame or field macroblocks can be divided into blocks, and each of said block comprises 16x16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels.**

Motorola has satisfied this method claim.

The claim term "said frame or field macroblocks can be divided into blocks, each of said block comprises 16 16, 16 by 8 pixels, 8 by 16 pixels, 8 by 8 pixels, 8 by 4

pixels, 4 by 8 pixels, or 4 by 4 pixels" has been construed to mean "the frame macroblocks or field macroblocks can be divided into each of the following block sizes: 16 16, 16 by 8 pixels, 8 by16 pixels, 8 by 8 pixels, 8 by 4 pixels, 4 by 8 pixels, or 4 by 4 pixels."

In compliance with the H.264 Standard, the VIP12XX must be able to decode macroblocks that have been partitioned into each of the seven block sizes. CX-29 at 26, 105-07; CX-706C (Drabik WS) at 468-69. The SMP8634 manual confirms that the chip operates on each of the seven block sizes. The [ ] identify a [ ] and a [ ] that identify how the macroblock is partitioned. CX-214C at SIGMA_0000578.

VIII. U.S. Patent No. 5,357,571

U.S. Patent No. 5,357,571 ("the '571 patent") is titled, "Method for Point-to-Point Communications within Secure Communication Systems." JX-3 ('571 patent). The '571 patent issued on October 18, 1994, and the named inventor is Dean E. Banwart. *Id.* The '571 patent "relates generally to communication systems and, in particular, to a method for providing point-to-point communications within secure communication systems." *Id.* at col. 1, lns. 7-10 (Field of the Invention).

Motorola asserts independent method claim 12 and dependent claim 13. The asserted claims read as follows:

> **12.** In a secure communication system that includes a plurality of communication units, wherein each communication unit of the plurality of communication units stores a limited set of encryption key variables, a method for a communication unit of the plurality of communication units to receive a point-to-point communication within the

secure communication system, the method comprises the steps of:

a) receiving, by the communication unit, identity of an encryption key variable and information pertaining to a predetermined function, wherein the identity of the encryption key variable and information pertaining to the predetermined function have been transmitted by a transmitting communication unit;

b) generating, by the communication unit, a private call key variable based on the encryption key variable and the information pertaining to the predetermined function; and

c) utilizing the private call key variable to privately communicate with the transmitting communication unit.

13. In the method of claim **12**, step (b) further comprises generating the, private call key variable by modifying the encryption key variable based on information pertaining to the predetermined function, wherein the information pertaining to the predetermined function includes, at least in part, a unique identification code of the communication unit, a unique identification code of the transmitting communication unit, or a combination of the unique identification code of the communication unit and the unique identification code of the transmitting communication unit.

JX-3 at col. 9, lns. 28-58.

A. Claim Construction[72]

1. "communication unit" (claims 12 and 13)

[72] A person of ordinary skill in the art in the July/August 1993 timeframe was typically a person having at least a bachelor's degree in electrical or computer engineering or equivalent and at least three years of experience working in data communications. This would include working in the field of network communications, including cryptographic protection of data within a communication system, and including the hardware and/or software necessary to implement the cryptographic protection of the data. Common systems in this field included cellular systems, paging systems, telephone systems, and wired or wireless data networking systems. CX-708C (Acampora WS) at 15-16.

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Claim Term	Motorola's Proposed Construction	Microsoft's Proposed Construction
"communication unit" (claims 12 and 13)	*No construction necessary.* *If construed:* a unit that communicates	a mobile transmitter and receiver used by an operator to communicate with another operator

The claim term "communication unit" appears in the preamble, and each of the three steps of independent claim 12, and in dependent claim 13. JX-3.[73]

Motorola construes the term to mean "a unit that communicates." Compls. Br. at 164. Microsoft construes the term to mean "a mobile transmitter and receiver used by an operator to communicate with another operator." Resp. Br. at 40.

As proposed by Motorola, the claim term "communication unit" is construed to mean "a unit that communicates."

The plain language of the claim dictates that any unit that communicates is a "communication unit."

"Communication systems are known to comprise mobile transmitters and receivers, such as in-car mobile or hand-held portable radios, hereafter referred to as communication units, as well as fixed transmitters and fixed receivers, such as base stations or controllers (fixed end)." JX-3 ('571 patent) at col. 1, lns. 13-18. This passage provides examples of communication units and is not a limitation. The use in that passage of the open-ended term "comprise" makes clear that these are examples and that additional, unrecited communication units beyond those expressly listed are envisioned by the patent. *See, e.g., Mars Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 1376 (Fed. Cir. 2004).

[73] The claim term also appears in non-asserted claims. JX-3.

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Furthermore, the specification explicitly discloses an example of communication units that may be "fixed dispatch type equipment." JX-3 at col. 3, lns. 18-24.[74] As Mr. Banwart, the inventor, explained, the actual "ASTRO" communication units that the patent refers to (JX-3 at col. 3, lns. 21-23) included units that were not mobile. Banwart Tr. 726-27, 731; *see also* Acampora Tr. 925–27 ("[A]mong the communication units could be remote units that are used for remote monitoring purposes.... And such a unit would not necessarily be mobile. In fact it wouldn't be. It would be fixed."); Geier Tr. 1239-1240 (discussing fixed units). Thus, a communication unit may be fixed, mobile, or portable, without limitation. Under Microsoft's construction, in the preferred embodiment of a police communication system disclosed in the '571 patent, there could be no fixed communication units at police stations. Only the policemen outside the station could communicate with each other. That makes no sense.

Accordingly, there is no basis to require the communication units to be "mobile," as Microsoft proposes.

As to whether the communication units must be used by a user, Figure 1 specifically shows two communication units: (1) 102, which has the capability to receive input from a user, and (2) 103, which does ***not*** have that capability. CX-708C (Acampora WS) at 53. The specification states, "It is understood that either or both of the communication units (102-103) could include an input/output device." JX-3 at col. 2, ln. 67 (emphasis added). Thus, an operator is not required. Banwart Tr. 706, 726 ("[T]he

[74] There is a typographical error in the passage at column 3, line 20, of the '571 patent, in which a comma is missing between "a radio mounted in a vehicle" and "fixed dispatch type equipment." The comma is present in the as-filed application. JX-4 at MOTM_ITC 0000149.

unit could be free-standing without human users with it."), 727 (examples of unmanned devices), 731; Geier Tr. 1240–41. Moreover, although claims 1, 6, 9 and 15 specifically require that there be an "operator" of a communication unit, asserted claim 12 does not. The basic rule of "claim differentiation" dictates that Microsoft's construction is wrong. *Karlin Tech., Inc. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 971-72 (Fed. Cir. 1999).

Accordingly, there is no basis to require the communication units to be "used by an operator to communicate with another operator," as Microsoft proposes.

2. "encryption key variable" (claims 12 and 13)

Claim Term	Motorola's Proposed Construction	Microsoft's Proposed Construction
"encryption key variable" (claims 12 and 13)	*No construction necessary.* *If construed:* a stored value used to generate a private call key variable	information used by an encryption algorithm to uniquely encrypt data and by a decryption algorithm to decrypt the data

The claim term "encryption key variable" appears in the preamble, and steps a) and b) of independent claim 12, and in dependent claim 13. JX-3[75]

Motorola construes the term to mean "a stored value used to generate a private call key variable." Compls. Br. at 166. Microsoft construes the term to mean "information used by an encryption algorithm to uniquely encrypt data and by a decryption algorithm to decrypt the data." Resp. Br. at 46.

The claim term "encryption key variable" is construed to mean "a dynamic parameter used to reduce unauthorized eavesdropping of transmitted communication in a communication system."

[75] The claim term also appears in non-asserted claims 1, 2, 3, 6, 7, 9, 10, 11, 15, 16, and 17. JX-3.

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As indicated above, the claim term "encryption key variable" appears in the preamble, and the first and the second steps of independent method claim 12, and in dependent claim 13, as well as non-asserted claims 1, 2, 3, 6, 7, 9, 10, 11, 15, 16, and 17. JX-3.

Describing prior art in the background of the invention, the '571 patent discloses:

> Communication systems are known to comprise mobile transmitters and receivers, such as in-car mobile or hand-held portable radios, hereafter referred to as communication units, as well as fixed transmitters and fixed receivers, such as base stations or controllers (fixed end). A typical message within such a communication system may begin with a mobile unit converting an audio signal into a digital data stream suitable for transmission over an RF (radio frequency) channel to either another communication unit or the fixed end. Such systems are often used by public safety institutions, such as local or federal law enforcement agencies. The existence of commercially available radio frequency scanners makes it possible for unauthorized parties to monitor the information transmitted within such a communication system. To reduce unauthorized eavesdropping, communication systems encrypt communications such that, without knowledge of the encryption method and a decryptor, the communications are unintelligible.
>
> * * *
>
> As is known, digital encryption methods use a reversible algorithm to introduce randomness into a digital data stream. An algorithm that randomizes digital data is called an encryptor; that which reconstructs the original data from the randomized data, a decryptor. An encryptor/decryptor algorithm typically utilizes dynamic parameters, often referred to as keys or key variables, to uniquely specify the nature of the randomness introduced to the digital data stream. Thus, only encryptors and decryptors utilizing an identical algorithm and key are capable of reproducing intelligible messages. An example of an encryptor/decryptor algorithm is the Data Encryption

> Standard (DES). Typically, each communication unit within a secure communication system Can [sic] store anywhere from one to twenty keys for use in encrypted communications. A communication unit's capacity for key storage is typically limited by the cost of the storage devices and protection technology required to safely maintain a set of keys.

JX-3 at col. 1, lns. 13-50 (emphases added).

Thus, the '571 patent specification explains that "communication systems encrypt communications" in order to "reduce unauthorized eavesdropping." The specification also explains that "[a]n encryptor/decryptor algorithm typically utilizes dynamic parameters, often referred to as keys or key variables." Further, the specification also discloses prior art Data Encryption Standard (DES) as an example of an encryptor/decryptor algorithm. Therefore, a person of ordinary skill would understand the claim term "encryption key variable" to mean some type of a dynamic parameter that is used to reduce unauthorized eavesdropping of communication that is transmitted in a communication system.

Microsoft argues that "[t]he specification repeatedly notes that the defining feature of an encryption key variable is that it can be used by an encryption algorithm to encrypt/decrypt data, consistent with Microsoft's construction." Resp. Br. at 46. Microsoft contends that "an encryption key variable is one that is provided to the encryptor/decryptor for use in encrypting/decrypting data, whether directly or after modification, depending on whether the encryption key variable is used for group-wide or point-to-point communications." *Id.* at 47 citing JX-3 at col. 3, lns. 43-53, and col. 4, lns. 1-6.

Indeed, the specification portions cited by Microsoft appear to support

Microsoft's proposed claim construction. However, as discussed below, they do not.

Describing the present invention in FIG. 1, the '571 patent discloses:

> When directed to establish an encrypted communication session, such as an encrypted group-wide call, the microprocessor (106, 109) retrieves an encryption key variable from memory storage (107, 110). This information is used in conjunction with the encryptor/decryptor device to encrypt/decrypt information normally transmitted to/from other communication units. In order for all communication units involved in the group-wide call to reproduce intelligible information, they must each be utilizing the identical encryption key variable. Conversely, if an operator of a communication unit washed [sic] to engage in a point-to-point communication, they Would [sic] require the exclusive use of an encryption key variable for the duration of the communication, thereby preventing other communication units from legitimately using that key.

JX-3 at col. 3, lns. 43-58 (emphases added). Here, the '571 patent explains that when making a group-wide call, the encryption key variable is retrieved from memory and is then used in conjunction with prior art encryptor/decryptor to encrypt/decrypt the information.

Describing a logic diagram of the present invention shown in FIG. 2, the '571 patent discloses:

> To ensure the security of the point-to-point communication, the first communication unit determines a private call key variable (201). To this end, a predetermined function is used to modify an encryption key such that the resultant private all [sic] key variable is unique and reproducible. As a first example of the predetermined function, the operator of the first communication unit is prompted for a unique user code in addition to the unique identification code of the destination communication unit(s). The unique user Code [sic] is used to modify an encryption key variable via a known process, discussed below, to create the private call key variable such that the private call key variable is equal

in length and validity as the encryption key variable.

JX-3 at col. 4, lns. 1-14 (emphases added). Thus, the '571 patent specification explains that in a *point-to-point communication*, an encryption key variable is modified by using a predetermined function to generate a private call key variable.

Indeed, describing the present invention generally, the '571 patent discloses:

> Generally, the present invention provides a method for secure point-to-point communications within a secure communications system. This is accomplished by allowing a plurality of communication units within the system to generate unique encryption key variables from a limited set of encryption key variables stored in each communication unit. For example, an Operator of a first communication unit selects at least one destination communication unit for a point-to-point communication. A private call key variable is generated by the first communication unit by modifying an encryption key variable of the limited set of encryption key variables based on a predetermined function. An identity of the encryption key variable and information pertaining to the predetermined function used to generate the private call key are transmitted by the first communication unit to the destination communication unit, which in turn generates the private call key variable based on the identity of the encryption key variable and information pertaining to the predetermined function. At this point, the first communication unit and the destination communication unit(s) are free to engage in a secure point-to-point communication without other communication units in the secure system being able to eavesdrop or without having to add a large number of encryption keys to the secure system.

JX-3 at col. 2, lns. 26-51 (emphases added).

Therefore, as noted above, in the prior art, an encryption key variable was used in such algorithms as "DES" (Data Encryption Standard). For the present invention, however, an encryption key variable is used in an encryption algorithm that uses a predetermined function to generate a private call key variable, and then uses the private

call key variable for the remaining steps.

Most importantly, in all of the claims (asserted and non-asserted) that contain an "encryption key variable" limitation (claims 1, 2, 3, 6, 7, 9, 10, 11, 12, 13, 15, 16, and 17), the "encryption key variable" is used in some way to generate a "private call key variable" in a "point-to-point communication."

Contrary to the claimed invention, Microsoft is attempting to inject into its claim construction the requirement that all encryption key variables be capable of use in prior art encryption algorithms. Microsoft relies on the preferred embodiment in which the encryption key variable could be used in the encryption algorithm of the invention to generate a private call key variable, and also be used in a prior art encryption algorithm. Microsoft then uses its claim construction to impose a claim requirement that a system be able to use the prior art approach. This is improper.

Motorola, in support of its proposed claim construction ("a stored value used to generate a private call key variable"), argues that the claim term "encryption key variable" refers to the stored keys used to generate the private call key variables, and that it is the private call key variables, not the encryption key variables, that encrypt/decrypt data under the terminology of the claims. Compls. Br. at 166.

Motorola's argument is rejected. Motorola's proposed construction erroneously seeks to import other claim limitations into this term and thereby renders those limitations redundant. First, Motorola's construction requires that an encryption key variable be "stored," which would render the phrase "stores a limited set of encryption key variables" in the preamble of the asserted independent claims redundant. The second component of Motorola's proposed construction, "used to generate a private call key

variable," would render the phrase "generating … a private call key variable based on the encryption key variable" in step (b) of asserted claim 12 redundant.

Accordingly, the claim term "encryption key variable" is construed to mean "a dynamic parameter used to reduce unauthorized eavesdropping of transmitted communication in a communication system."

3. "point-to-point communication" (claim 12)

Claim Term	Motorola's Proposed Construction	Microsoft's Proposed Construction
"point-to-point communication" (claim 12)	*No construction necessary.* *If construed:* communication between two or more communication units	a communication initiated by an operator of a "communication unit" in which the operator identifies the destination operator's "communication unit."

The claim term "point-to-point communication" appears in the preamble of independent claim 12. JX-3.[76]

Motorola construes the term to mean "communication between two or more communication units." Compls. Br. at 167. Microsoft construes the term to mean "a communication initiated by an operator of a 'communication unit' in which the operator identifies the destination operator's 'communication unit'." Resp. Br. at 57.

The claim term "point-to-point communication" is construed to mean "secure communication between two or more communication units."

The '571 patent teaches that a "point-to-point communication" is one that is secure. *See* JX-3 at col. 6, lns. 51-65 ("The present invention provides method for point-to-point communications (secured private calls) within secure communications

[76] The claim term also appears in non-asserted claims. JX-3.

systems.").

As argued by Motorola, support for including "two ***or more*** communication units" within the ambit of this claim term is found, for example, in the Abstract, which states: "A first communications unit receives a request from an operator for a point-to-point communication identifying at least one destination communication unit." JX-3 at col. 2, lns. 31-35, 45-47, CX-708C (Acampora WS) at 49.

Microsoft does not dispute this, but instead attempts to impose a requirement that an operator (by which Microsoft presumably means a human operator) be involved at both ends of the communication. As discussed above with respect to the construction of "communication unit," there is no basis for imposing such a requirement. Point-to-point communications where one or both communication units operate autonomously are well within the ambit of the claimed '571 invention. Banwart Tr. 726-27; JX-3 at col. 2, ln. 67 – col. 3, ln.1, FIG. 1.

Accordingly, the claim term "point-to-point communication" is construed to mean "secure communication between two or more communication units."

4. "identity of an encryption key variable" (claim 12)

Claim Term	Motorola's Proposed Construction	Microsoft's Proposed Construction
"identity of an encryption key variable" (claim 12)	an identity separate and independent of the unique identification code of the communication unit	a unique identifier of the encryption key variable, including the key itself

The claim term "identity of an encryption key variable" appears in step a) of independent claim 12. JX-3.

Motorola construes the term to mean "an identity separate and independent of the

unique identification code of the communication unit." Compls. Br. at 167. Microsoft construes the term to mean "a unique identifier of the encryption key variable, including the key itself." Resp. Br. at 50.

The claim term "identity of an encryption key variable" is construed to mean "an identifier that is capable of uniquely identifying which encryption key variable of the limited set is being used."

First, the plain language of the disputed claim term shows that the term should mean an identifier that is capable of uniquely identifying a particular encryption key variable. Consistent with the plain language, the '571 patent specification discloses that "[t]he identification of the encryption key variable is typically an index number or label capable of uniquely identifying which key of the limited set is being used." JX-3 at col. 5, lns. 13-16 (emphasis added); RRX-23C (Geier RWS) at 28-29.

Microsoft's proposed construction, in which the encryption key variable itself can serve as the "identity of an encryption key variable," is rejected. CX-708C (Acampora WS) at 51. As noted above, the identity of the encryption key variable is used to identify "which key of the limited set is being used." By "limited set," the specification is referring to the claimed limited set of stored encryption key variables. By the very words of the claims, the encryption key variable must be stored in a communication unit before the communication unit can receive the identity of that encryption key variable. Geier Tr. 1247-48.

Motorola's proposed requirement that the identity of the encryption key variable be "separate and independent" of the identification code of the communication unit lacks support. The specification does not prohibit a relationship between the identity of the

encryption key variable and the identity of the communication unit. RRX-23C (Geier RWS) at 27-28.

5. "private call key variable" (claims 12 and 13)

Claim Term	Motorola's Proposed Construction	Microsoft's Proposed Construction
"private call key variable" (claims 12 and 13)	a session key used throughout a communication session without the necessity to re-generate the key after each packet or message is transmitted	information used by an encryption algorithm to uniquely encrypt data and by a decryption algorithm to decrypt the data when the "communication unit" is engaged in "point-to-point communication"

The claim term "private call key variable" appears in steps b) and c) of independent claim 12, and in dependent claim 13. JX-3.[77]

Motorola construes the term to mean "a session key used throughout a communication session without the necessity to re-generate the key after each packet or message is transmitted." Compls. Br. at 169. Microsoft construes the term to mean "information used by an encryption algorithm to uniquely encrypt data and by a decryption algorithm to decrypt the data when the "communication unit" is engaged in "point-to-point communication"." Resp. Br. at 54.

The claim term "private call key variable" is construed to mean "a dynamic parameter used in a point-to-point communication in a communication system."

In connection with the claim term "encryption key variable," the undersigned has construed the term "key variable" to mean "a dynamic parameter," *supra*; *see* JX-3 at col. 1, lns. 13-50.

[77] The claim term also appears in non-asserted claims. JX-3.

Additionally, the term "private call" in "private call key variable" is synonymous with a secure communication, *i.e.*, a point-to-point communication. *See* JX-3 at col. 6, lns. 51-65 ("The present invention provides method for point-to-point communications (secured private calls) within secure communications systems"). As the '571 patent specification explains, "[a] private call key variable is generated . . . by modifying an encryption key variable of the limited set of encryption key variables based on a predetermined function." JX-3 at col. 2, lns. 35-38. By creating this private call key variable, communication units "are free to engage in a secure point-to-point communication without other communication units in the secure system being able to eavesdrop . . . ." *Id.* at col. 2, lns. 45-49 (emphasis added).

B. Infringement Analysis of the '571 Patent

Microsoft argues that Motorola has failed to show that anyone has ever performed the method steps of all asserted claims of the '571 patent. Resp. Br. at 10. According to Microsoft, it is not enough to show that a particular article is capable of performing the claimed steps; instead, the patentee must show that each step is actually performed in the United States. *Id.* (citing *Joy Techs., Inc. v. Flakt, Inc.*, 6 F.3d 770, 775 (Fed. Cir. 1993)). Microsoft's argument is rejected.

Motorola's infringement claims are based, in part, on the Xbox's implementation of the IEEE's 802.11 standard, colloquially known as Wi-Fi, and the normal use of the Xbox with Wi-Fi in a home environment. As confirmed by Microsoft's own admissions, the Xbox products are compliant with the IEEE 802.11 standard. *See, e.g.*, CX-708C (Acampora WS) at 87-95; CX-22; CX-23; CX-378C; CX-379C; CX-643C (Casebolt Tr. 38-39, 57, 79, 81, 88, 96-98); CX-648C (McClive Tr. 95-96, 132); CX-653C (Steiner Tr.

12, 35-41, 54, 97-100); CX-654C (Caruana Dep. Tr.) at 9-21, 30, 36-37, 116-117, 154. For all purposes pertinent to this investigation, the IEEE 802.11 standard is fully and completely described in a standards document referred to as "802.11-2007." CX-708C (Acampora WS) at 86-87; CX-383. The 802.11-2007 document therefore also describes a product that complies with the standard, including the Xbox. CX-708C (Acampora WS) at 86-87.

1. Accused Products

Motorola argues that the accused products are Microsoft's Xbox 360 console, including the Xbox 360 S 4 GB and 250 GB consoles, as well as the Xbox 360 Wireless N Adapter (collectively, "the Xbox"), imported into the United States, and/or sold after importation. Compls. Br. at 169-70 (citing CX-708C (Acampora WS) at 86 and Tab D).

Microsoft argues that Motorola failed to provide any evidence that the accused products that contain [ ] infringe the '571 patent. Resp. Br. at 8-10. Microsoft asserts that "[a]ll Wireless N Adapter products currently being sold use the [ ] and certain Xbox consoles contain a [ ] that uses the [ ]" *Id.* at 8 (citing RX-317C (Caruana WS) at Q29). Microsoft explains that "Motorola was aware of these [ ] and took discovery on these devices." *Id.* (citing CX-654C (Caruana Dep. Tr.) at 33-36). It is argued that "Motorola nevertheless chose not to perform an infringement analysis on any of these Atheros-based devices." *Id.* (citing CX-708C (Acampora WS) at Tab E, p. 2 ("Other Xbox products use, or are planned to use, WiFi chips from [ ]. This analysis focuses on the [ ] WiFi chip").

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Motorola argues that "Microsoft apparently seeks to exploit discovery misconduct and to end-run the Commission's enforcement remedies." Compls. Reply Br. at 51. Motorola contends that "there is no basis for entering specific findings with respect to [ ] Xbox products." *Id.* at 52. Motorola asserts that "[t]o date, no Xbox product with an [ ] has been imported," and that "Microsoft has not contended otherwise." *Id.*

Motorola explains:

> Early in this Investigation, Motorola interrogatories required Microsoft to identify all Xbox products that were "currently being, ***or in the next twelve (12) months will be*** … imported." CX-629C at 9. Those interrogatories further requested identification of the chip contained in such product. *Id.* at 9-10. In response, Microsoft identified only the Xbox product code-named [ ] Microsoft's name for Xbox products using [ ] chips. CX-630C at 17. And Microsoft only identified [ ] chips. CX-630C at 18 ("The Xbox 360 S 250 GB and Xbox 360 S 4 GB Consoles use the [ ] Wi-Fi chip."), 22 ("The Xbox 360 S 250 GB and Xbox 360 S 4GB consoles use a wireless module assembly provided by [ ]"). Microsoft supplemented its response on April 22, 2011, but did not identify [ ] or any other chip manufacturer. CX-631C at 4-5. Microsoft did not further supplement.
>
> In addition, two Microsoft corporate deposition witnesses confirmed (as late as June 24, 2011, three weeks before the close of fact discovery) that imported Xboxes did not contain [ ] chips, and that Xboxes with [ ] chips had not yet even left the factory. CX-643 (Casebolt) at 125, 127-28; CX-654C (Caruana [Dep. Tr.]) at 34-35. Long after discovery closed, Microsoft employee Casebolt testified in his September 9, 2011 direct written testimony that the Xbox with [ ] was still not being shipped. RX-314C at 8.

Id. at 52-53.

First, RX-317C (Caruana WS) does not support Microsoft's assertion that "[a]ll Wireless N Adapter products currently being sold use the [ ] and certain Xbox consoles contain a [ ] that uses the [ ]." Q29 states:

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"**Which wireless networking products use Atheros chipsets?**" Mr. Caruana's answer is: [ ] RX-317C (Caruana WS) at Q29 (emphasis in original). In reality, the question and answer is silent about whether these [ ] products are "currently being sold."

If in fact Microsoft has imported Xbox products containing [ ] Microsoft has violated its discovery obligations under 19 C.F.R. 210.27(c) by failing to satisfy its "duty seasonably to amend a prior response to an interrogatory … or request for admission." Moreover, the parties have not presented evidence and arguments specifically addressing new products containing [ ].

Accordingly, the administrative law judge is not making any factual findings on whether Xbox products containing [ ] are non-infringing.

2. Direct Infringement

For the reasons set forth below, Motorola has shown that Microsoft's accused products directly infringe all asserted claims of the '571 patent.

Claim 12

The preamble of independent method claim 12 recites:

> **In a secure communication system that includes a plurality of communication units, wherein each communication unit of the plurality of communication units stores a limited set of encryption key variables, a method for a communication unit of the plurality of communication units to receive a point-to-point communication within the secure communication system, the method comprises the steps of:**

Motorola has satisfied the preamble.

The claim term "communication unit" has been construed to mean "a unit that

communicates." The claim term "encryption key variable" has been construed to mean "a dynamic parameter used to reduce unauthorized eavesdropping of transmitted communication in a communication system." The claim term "point-to-point communication" has been construed to mean "secure communication between two or more communication units."

When the Xbox is used with a Wi-Fi router, with both set for WPA or WPA2 security, the Xbox and the router are communication units in a secure communication system, with point-to-point communication between the router and the Xbox. CX-708C (Acampora WS) at 123. The infringing use consists of Wi-Fi communication between the Xbox and the Wi-Fi router. That a router can be a communication unit is confirmed by the fact that the ASTRO system, cited in the '571 specification as an exemplary communication unit, included router units that could encode/decode a wireless communication to allow wireless users to connect to a wired phone network, just as a Wi-Fi router allows a wireless user to connect to the wired Internet. Banwart Tr. 727-728, 731.

The claim term "encryption key variable" has been construed to mean "a dynamic parameter used to reduce unauthorized eavesdropping of transmitted communication in a communication system."

When set for WPA or WPA2 security, the Xbox and the router store a limited number of encryption key variables. In particular, [

] CX-708C (Acampora WS) at 124; Acampora Tr. 932; Caruana Tr. 1157; Geier Tr. 1216. [

] CX-386. [

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] Geier Tr. 1216. After that initial login, [ ]. Geier Tr. 1216; CDX-14 and CDX-15 (demonstrating login and reconnection process). Also, as required by the parties' agreed-upon construction of the preamble, [ ] CX-708C (Acampora WS) at 125-135, 153-156; CDX-17; Geier Tr. 1216; CX-654C (Caruana Dep. Tr.) at 75, 161-63; CX-387C. The passphrase of the router is an encryption key variable, a dynamic parameter used to reduce unauthorized eavesdropping of transmitted communication in a communication system. CX-708C (Acampora WS) at 124-129.

Microsoft argues that the stored passphrase is not an encryption key variable. Microsoft argues that under its claim construction, the encryption key variable must be used by an encryption/decryption algorithm to uniquely encrypt/decrypt data. RRX-23C (Geier RWS) at 34-40. Microsoft's proposed claim construction was rejected, *supra*.

Step a) of claim 12 recites:

> **a) receiving, by the communication unit, identity of an encryption key variable and information pertaining to a predetermined function, wherein the identity of the encryption key variable and information pertaining to the predetermined function have been transmitted by a transmitting communication unit;**

Motorola has satisfied this claim step.

The claim term "identity of an encryption key variable" has been construed to mean "an identifier that is capable of uniquely identifying which encryption key variable of the limited set is being used."

Xbox consoles when used with an 802.11-compliant router, with both set for